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In the Supreme Court of the United States

OCTOBER TERM, 1949.

No. 2

GRAVER TANK & MFG. CO., INC.,
THE LINCOLN ELECTRIC COMPANY,
GRAVER TANK & MFG. CORPORATION,
Petitioners,

v.

THE LINDE AIR PRODUCTS COMPANY,
Respondent.

ON WRIT OF CERTIORARI TO COURT OF APPEALS
FOR SEVENTH CIRCUIT.

PETITIONERS' OPENING BRIEF UPON REHEARING.

JOHN F. OBERLIN,
Leader Building,
Cleveland 14, Ohio,

ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
JAMES R. STEWART,
2800 Terminal Tower,
Cleveland 13, Ohio,

CHARLES L. BYRON,
First National Bank Building,
Chicago 3, Illinois,
Counsel for Petitioners.

September 16, 1949.

FOREWORD.

The essential materials for the decision of this case are:

Claims:

"We claim: [welding fluxes] * * * containing a major proportion of alkaline earth metal silicate". (Claims 18, 20, 22, 23, R. 960).

Specification:

"We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions. * * * While a number of these * * * are more or less efficacious * * * we prefer to use silicates of the alkaline earth metals" (patent, R. 956, col. 1, lines 62-72).

Findings:

Lincoln's "accused flux is composed principally of manganese silicate" (Op., R. 919-20; Finding 21, R. 926).

"Manganese is not an alkaline earth metal" (Finding 12, R. 925).

Question:

Are claims which are expressly limited to "alkaline earth metal" silicates infringed by a flux which is not an alkaline earth metal silicate?

Law:

"The statute makes provision for specification separately from the claims * * *. * * * it is the claim which measures the grant", (holding of this Court upon prior review, 326 U. S. 271, 277).

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ON WRIT OF CERTIORARI TO COURT OF APPEALS
FOR SEVENTH CIRCUIT.

PETITIONERS' OPENING BRIEF UPON REHEARING.

This is a patent case now here upon rehearing.

Rehearing of the prior decision, 336 U. S. 271, is confined to the issue of infringement. The Court's order recites:

> "The petition for rehearing is granted, limited to the question of infringement of Claims 18, 20, 22 and 23 of the Jones, *et al.* patent. The Court desires argument as to the applicability of the doctrine of equivalents to the findings of fact in this case." 337 U. S. 910.

To avoid necessity for referring to earlier briefs, petitioners will brief the case anew, limited to the issue assigned for rehearing. As will be seen, the trial court held the accused flux an equivalent only by expanding the claims by resort to the specification. However:

1. The claims measure the grant and cannot so be expanded to embrace what the claims as written ex-

2. The doctrine of equivalents, used as a tool to expand the claims of a patent, has been undermined by this Court's cases and should be expressly repudiated.

3. Even if the doctrine of equivalents survives it is not broad enough to make the accused flux an infringement.

PRIOR OPINIONS.

The prior opinions, rulings and important papers may be found:

District Court:

Opinion of District Judge Swygert of the Northern District of Indiana, Hammond Division, holding valid and infringed the four claims now before this Court, and holding invalid all of the other claims in issue, is reported in 75 USPQ 231 and appears in Volume I of the record, page 907.

Findings of fact are in Volume I, page 923.

Jones patent in suit is in Volume I, page 955.

Court of Appeals:

Opinion of Circuit Judges Sparks, Major and Minton, of the Seventh Circuit, holding valid all claims in issue and holding four infringed, is reported in 167 F. (2d) 531, and appears in Volume I, page 990.

Supreme Court:

Order granting the writs of certiorari is reported in 335 U. S. 810.

Opinion upon the prior review by Mr. Justice Jackson and concurring opinion by Mr. Justice Black and Mr. Justice Douglas, holding all claims in issue

invalid except the four claims which were held valid and infringed, is reported in 336 U. S. 271.

Order granting rehearing is reported in 337 U. S. 910.

JURISDICTION.

Jurisdiction was invoked under Section 240(a) of the Judicial Code as amended by the Act of February 13, 1925, 28 U. S. C. § 347(a), which was in effect when the petition for writs of certiorari was filed. This statute is now Section 1254(1) of the Federal Judicial Code, 28 U. S. C. § 1254(1).

STATEMENT OF FACTS.

The Jones patent in suit, No. 2,043,960 (R. 955), owned by respondent The Linde Air Products Company, by assignment from its parent Union Carbide and Carbon Corporation, originally issued upon a claimed new process of electric welding and fluxes for use therewith.

The action, brought by the patent owner Linde, charged infringement by Lincoln, a manufacturer of electric arc welding equipment, supplies and fluxes, and the Graver Companies, users of Lincoln materials (R. 14-5).

Upon the prior review, 336 U. S. 271, this Court held 19 claims of the patent invalid, including all of the process claims and all of the flux claims in issue except claims 18, 20, 22 and 23.[1] These four flux claims the Court held valid and infringed.

---

[1] This Court held invalid:

Process claims 1, 3, 4, 7, 8, 9 (because they make no reference to the essential chemical constituents of the composition to be used in the process);

Process claims 5, 6, 11, 12, 13, 14, 15, 46, 17 (because they erroneously import that the patented process makes no use of the electric arc phenomenon);

(Continued on following page)

The Issue Remaining.

The question is: Are claims 18, 20, 22, 23, upon the doctrine of equivalents or otherwise, infringed?

Each of these claims is limited to a flux "containing a major proportion of alkaline earth metal silicate."[2] But Lincoln did not use an alkaline earth metal silicate.

---

[2] The alkaline earth metals are calcium, magnesium, strontium and barium (Finding 11, R. 925). The claims read:

"18. A composition for electric welding *containing a major proportion of alkaline earth metal silicate*, and being substantially free from uncombined iron oxide and from substances capable of evolving gases under welding conditions.

20. A composition for electric welding containing a fluoride and a *major proportion of alkaline earth metal silicate*, and being substantially free from uncombined iron oxide and from substances capable of evolving gases under welding conditions.

22. A finely-divided unbonded fusible electric welding composition containing a fluoride and a *major proportion of an alkaline earth metal silicate.*

23. A finely-divided unbonded fusible composition for use in electric welding employing a bare metal electrode as a source of weld metal, said composition being substantially free from substances capable of evolving a detrimental quantity of gas under welding conditions and containing calcium fluoride and a *major proportion of one or more alkaline earth metal silicates.*" (R. 960.)

(Continued from preceding page)

Process claim 2 (because it is broader than the invention; the Court held it could not be saved by resort to the specification);

Flux claims 24 and 26 (because they include inoperable compounds and are therefore broader than the invention; in view of the rule that it is the claim that measures the grant, the Court held they could not be saved by reading the specification into the claims);

Flux claim 27 (because it incorporates the invalid are-less process).

The claims held valid and infringed, and now again before the Court, are flux claims 18, 20, 22, 23.

The claims which were not in issue are process claim 10 and flux claims 19, 21, 25, 28, 29.

Lincoln used manganese silicate which is *not* an alkaline earth metal silicate. The trial court found:

1. "Essentially the accused welding composition comprises manganese silicate to which has been added a small amount of calcium fluoride" (R. 919; Finding 21, R. 926).
2. Manganese, which Lincoln used, "*is not an alkaline earth metal*" [3] (Finding 12, R. 925).
3. "Since the accused flux is composed principally of manganese silicate, it does not literally infringe composition claims 18, 20, 22 and 23" (R. 919-20).

The trial court, however, condemned Lincoln an infringer by reading the specification into the claims (R. 920) to make them cover not only the validly claimed alkaline earth metal silicate fluxes *but also* something more. This is the way the trial court arrived at that conclusion:

> "In the patent [that is, in the specification, R. 956, col. 1, lines 62-5] the inventors state, 'We have used calcium silicate and silicates of sodium, barium, iron, *manganese* [which Lincoln used], cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions.' Thus, the fact that manganese is a proper substitute for calcium silicate as a major ingredient of the welding composition invented by Jones, Kennedy and Rotermund is fully disclosed *in the specification* of their patent." (R. 920.)

Accordingly, the trial court found:

> "Manganese silicate is one of the nine metallic silicates *which the specification discloses* that the inventors have used as principal constituents in welding compositions attaining more or less effectively the objectives of their invention." (Findings 13, 14, 24, R. 925, 927.)

Thus, because manganese silicate, which Lincoln used, is named in the specification, the trial court read claims

[3] Emphasis supplied throughout the brief.

18, 20, 22, and 23 to cover not only the alkaline earth metal silicates, to which these claims are confined, but expanded them to embrace manganese silicate which is not claimed. But this cannot be done, as this Court recognized in overthrowing claims 24 and 26, holding they could not be saved by resort to the specification.

Prior Use of Fluxes.

The patent as now restricted[1] and the findings upon which the narrow issue before the Court turns, derive meaning from the art to which they relate. It is important, therefore, to bear in mind certain facts about welding and the use of fluxes in connection therewith.

What occurs in welding steel plates is that, under the intense heat of the electric arc, the pieces to be joined are melted at their adjoining edges. The metal thus melted coalesces, usually with additional fused metal deposited from a welding rod or electrode, to form a single piece (R. 439). While the metal is molten, however, it must be kept from contact with the air (R. 170-3, 447, 735, 898).

—Object Is to Exclude Air.

There are two reasons why the metal while molten must be protected from exposure to air:

First. Molten metal if exposed to air will oxidize (R. 170-3). The result, if oxidation were allowed to occur, would be a weld brittle, porous, and wanting in tensile strength (R. 172).

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[1] After this Court's decision respondent cancelled claims 1 through 17, and claims 24, 26, 27, 28, 29. See letter of April 28, 1949, from counsel for Linde, advising the Court thereof. The disclaimer, filed March 15, 1949, is reported in the United States PATENT OFFICE GAZETTE of April 19, 1949, Volume 621, page 642. The legal effect of this is to remove these claims from the patent. *Maytag Company v. Hurley Machine Co.* (1939), 307 U. S. 243, 245; *Altoona Publix Theatres, Inc. v. American Tri-Ergon Corp.* (1935), 294 U. S. 477, 492; *Marconi Wireless Telegraph Company of America v. United States* (1943), 320 U. S. 1, 57-60; *Enstein v. Simon, Ascher & Company, Incorporated* (1931), 282 U. S. 445, 453.

Second. Molten metal, if exposed to air, will produce a reaction between oxygen and the carbon which is in all steel (R. 58). Carbon, joining with oxygen, forms a gas which, if trapped in the metal, shows up as a bubble or hole (R. 57-8, 459).

These problems encountered in welding (R. 170-3) are the same problems as are met in steel-making, or in any other metallurgical operation which reduces metal to a molten state. The metal while molten must be kept from contact with the air. To accomplish this the steel industry for generations has used the method of covering the molten metal with a molten slag or flux (i.e., limestone and sand) which, like oil on water, floats on top as a protecting mantle (R. 447).

In electric arc welding the same means of protecting the molten metal have long been used.

(3) In Hand Welding.

In hand methods of arc welding, using a short length of steel electrode, the flux generally is placed on the electrode as a coating (R. 442). The heat of the arc vaporizes and melts this flux, producing a protective medium for the arc zone, and a protecting layer of molten flux which floats on the molten weld metal (R. 116).

In addition to fluxes, combustible materials producing inert gases for the additional protection of the arc zone, have also been employed (R. 444).

Thus, in electric arc welding two means of protecting the molten metal have been used (1) displacing the air in the welding zone with an inert gas, or (2) as in the steel industry, covering the molten metal with a molten slag or flux.[5] But, whichever the method, the object is the same. It is to keep the air away from the molten metal.

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[5] The expired J. C. Lincoln patent No. 1,589,017, taught both. See claims 4 and 15 (Defts. Exh. 101, R. 458; 961, 966, 967). It taught avoidance of the oxidizing action of the air

"by using both an inert gas about the arc, and a protective medium for the weld, which I may term a slag" (R. 963, col. 1, lines 42-4)

These methods of protecting the molten metal have had wide application (R. 443). At least a half million tons of coated electrodes embodying these methods of blanketing the weld metal are produced annually (R. 442). They have been made in quantity for more than 20 years in all parts of the world (R. 442-3).

(ii) In Automatic Welding.

In automatic methods of arc welding, where a continuous electrode in the form of a wire mechanically fed from a reel (R. 454) is used, instead of supplying the flux as a coating on the electrode, it has been found preferable to lay the flux upon the seam to be welded. This was first taught by the expired J. C. Lincoln patent (see Figure 4, Lincoln Patent, Defts. Exh. 101, R. 458, 961).

Robinoff, who came along later, and whose method, except for the flux, the trial court found indistinguishable from Jones (Finding 27, R. 927), taught an improvement consisting in the use of a deeper layer of flux under which the welding operation takes place (R. 493-4, Defts. Exh. 108, R. 766, 901; Defts. Exh. 103, R. 460, 975). In this the flux is laid on the seam in a deep layer or is fed onto it ahead of the arc so as to submerge the arc in the compound (R. 493-4, 504, 737, 927) as shown in the illustration of Lincolnweld on the facing page.

Robinoff, long prior to the patent in suit, utilized an unpatented flux consisting of 89% clay (R. 507; Finding 6, R. 924) mainly aluminum silicate (R. 340); Lincoln used manganese silicate[6] (R. 919-20; Finding 21, R. 926). Jones,

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[6] This was taught by Miller, who in his patent, No. 1,754,566, issued in 1930, claimed:

"The process of welding ferrous metals which comprises fusing the metal and depositing the same under a molten slag containing *manganese silicate*" (Miller Patent, Defts. Exh. 145, R. 720, 969, 971, col. 1, lines 33-6).

(Continued on following page)

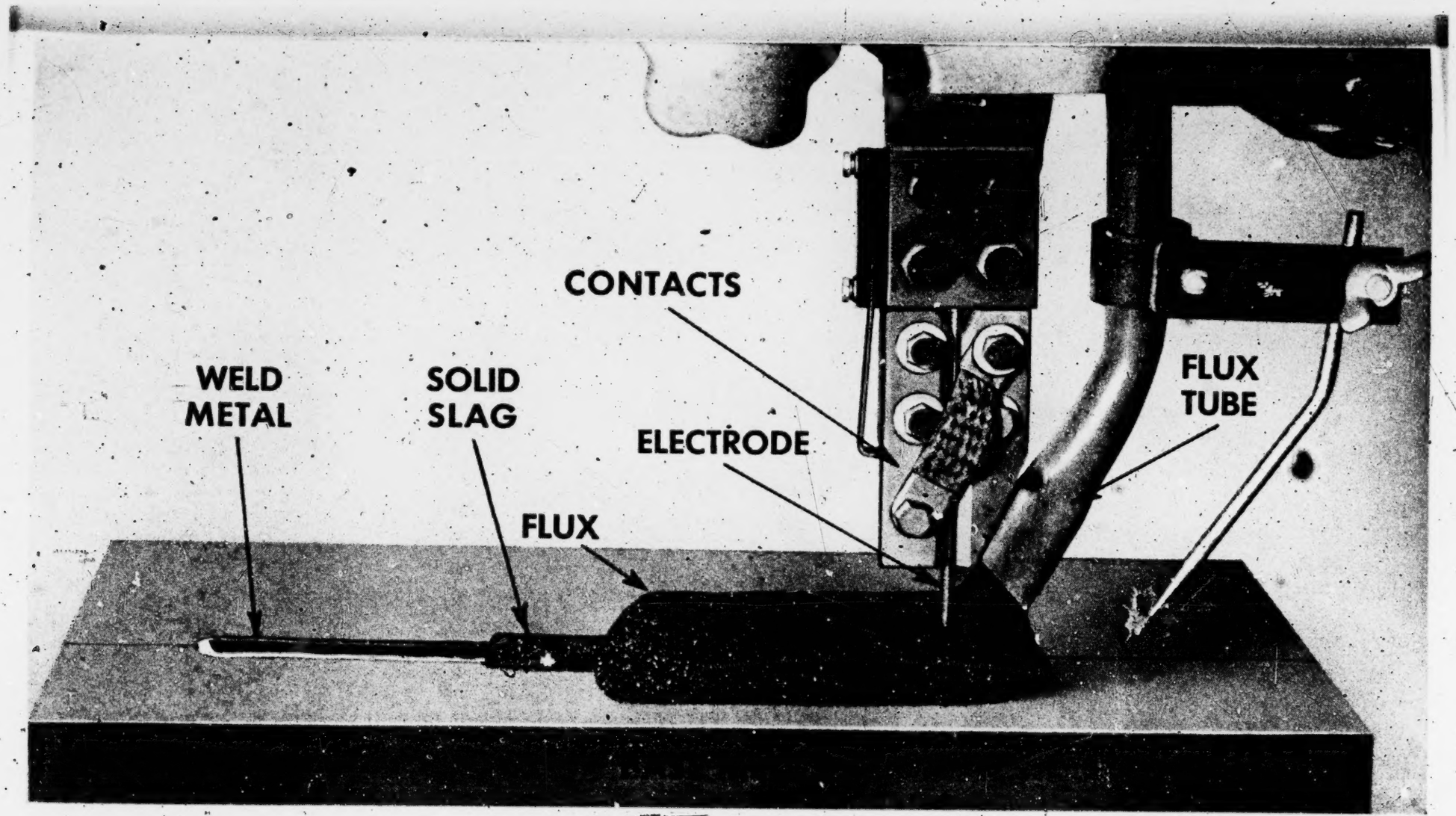

ILLUSTRATION OF LINCOLNWELD.

(Pltf. Exh. 203, R. 369.)

Note that the flux feeds onto seam in a deep layer in which the arc is submerged.

for use in the Robinoff process (Finding 7, R. 924; Finding 27, R. 927), found a specific combination of calcium and magnesium[7] silicates (R. 919), defined specifically in claims 29 and 10, and generally in claims 28, 25, 19, 21. This is the flux respondent demonstrated to the trial court (Pltf. Exh. 133A-B, R. 230, 107, 883). It is the flux found by the court to be the basis of Linde's "commercial success" (Finding 9, R. 925). **These claims are not charged as infringed** (R. 17). Jones, however, claimed, in addition, in claims 18, 20, 22, 23, now before the Court, all the alkaline earth metal silicates, namely, the silicates of calcium, magnesium, strontium; and barium (Finding 11, R. 925).

—Silicates Widely Used.

In determining how broadly claims 18, 20, 22, 23, now held valid, are to be read and to determine whether, by the doctrine of equivalents or otherwise, they may be expanded to cover also Lincoln's manganese silicate, it is important to note that the patentees did not invent silicates nor were they the first to discover their utility as welding fluxes.

Silicates were early found to be useful fluxes. They occur freely in nature and form a large part of the earth's

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[7] Although magnesium is confusingly similar in spelling to manganese it is important to bear in mind that they are not the same. Magnesium, which Linde used, is an alkaline earth metal, but manganese, which Lincoln used, is not (Findings 11, 12, R. 925). And, as will be seen, there are important differences between them.

(Continued from preceding page)

Miller, to be sure, was dealing primarily with manganese silicate used as a coating on electrodes, but his disclosure is not limited to such use. He says his manganese silicate may "be used in the form of powder into which the hot rod or electrode may be dipped, or * * * may be applied to the weld in any suitable way" (R. 971, col. 1, lines 21-4). He adds that use thereof "is included in my invention, whether or not the composition is applied to the rod as a coating" (R. 971, col. 1, lines 26-

crust (R. 304, 642). They also may be formed artificially by combining a metallic oxide with silicon dioxide.[1] The metallic oxide is the basic component and the silicon dioxide is the acidic component (R. 262). These, combined, produce a neutral substance, i.e., a silicate, neither basic nor acidic, which in most instances is quite stable and does not change its chemical properties upon being heated to its boiling point or upon cooling.

Now, as to the state of the art:

—Art Crowded.

The four claims held valid, which encompass fluxes "containing a major proportion of alkaline earth metal silicate," give Linde a monopoly on fluxes "containing a major proportion" of:

Calcium silicate, or
Magnesium silicate, or
Strontium silicate, or
Barium silicate,

and combinations thereof.

These are the alkaline earth metal silicates (Finding 11, R. 925).

However, by reading the specifications into these claims, as the trial court did (R. 920), these claims, confined to the four alkaline earth metal silicates, **are expanded** to give Linde also a monopoly of fluxes "containing a major proportion" of:

Sodium silicate, or
Iron silicate, or
Manganese silicate, which Lincoln used, or
Cobalt silicate, or

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[1] The "basic oxides, calcium, magnesium, manganese and aluminum, when combined with silica" form silicates (R. 263). "These oxides then are fused with silica * * * and in that way we get a silicate of whatever metals were used originally." (R. 264).

Nickel silicate, or

Aluminum silicate, which Robinoff used,

and combinations thereof.[9]

These are *not* alkaline earth metal silicates (Finding 11, R. 925).

It is important, therefore—lest, by a breadth of reading, these claims, confined to the four alkaline earth metal silicates, be made to swallow up the old along with the new—that note be taken of the field already occupied when the patentees came upon the scene.

The patentees entered a crowded art.[10]

(i) Many Flux Patents Issued.

Various combinations of ingredients, particularly silicates, or materials which at arc temperatures form silicates, had long been used for welding fluxes, and in related metallurgical operations. In steel making, for example, the slag universally used is limestone and sand which, combining in the heat of the furnace, form calcium silicate (R. 37, 60-1).

In electric furnace operation, where the electric arc is used as the heating instrumentality in a manner closely

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[9] The sentence in the specification the trial court relied upon to make Lincoln an infringer, and which, so read into the claims, gives Linde a monopoly on *all* of the nine silicates named, says:

> "We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum" (Patent, R. 956, col. 1, lines 62-4).

[10] But they did not know it was crowded. They were unfamiliar with the prior art use of fluxes comprised of silicates. As Kennedy, one of the inventors, put it:

> "I had never heard of any welding fluxes in electric welding * * *. Our experience in electric welding had been limited to bare wire welding, and we knew nothing whatever about electric welding fluxes" (R. 60).

The law, however, charges the inventor with knowledge of the past. *Mast, Foos & Co. v. Stover Manufacturing Company* (1900), 177 U. S. 485, 494; *Seymall v. Jones* (1875), 91 U. S. 171, 180.

analogous to electric arc welding (R. 461), Heroult, whose patent issued in 1903 (patent No. 721,703, Defts. Exh. 143, R. 720, 1328-30), used a flux composed of:

> "lime [calcium oxide], dolomite [calcium-magnesium carbonate], or oxid of iron liquefied by the addition of silica [sand]" (R. 1330, col. 1, lines 32-3),

which, combining, form calcium, magnesium or iron silicate.

For similar use Greene (patent No. 1,532,052, Defts. Exh. 143, R. 720, 1331-4) disclosed a flux consisting of lime, i.e., calcium oxide, and a substantial percentage of silica—in other words, calcium silicate.

The same, as well as many other metallic silicates thus used in steel making, have likewise long been used in electric arc welding to provide a protective flux or slag covering for the molten metal.[11]

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[11] See, for example, the patents collected in Defendant's Exhibits 144 and 145, R. 720, 1335-1443, and discussed at R. 724-34, many of which had expired when the present patentees appeared upon the scene. Thus for use in electric arc welding:

Strohmenger No. 1,041,525 (Defts. Exh. 144, R. 720, 1335-7) disclosed use of the silicates of sodium, aluminum and iron (R. 1336, lines 54-64) as to which he said "The fused covering acts as a flux and prevents the molten metal coming in contact with the air, thus preventing porosity" (R. 1336, lines 75-8).

Armstrong No. 1,241,899 (Defts. Exh. 144, R. 720, 1338-40) disclosed the use of "sodium silicate, aluminum silicate [i.e., clay]" (R. 1338, lines 63-4; R. 1339, lines 16-83).

Pescatore No. 1,277,639 (Defts. Exh. 144, R. 720, 1341-2) called for a "slag-forming material * * * of * * * calcium and iron silicate, or of blast furnace slag" (R. 1342, lines 18-24).

Jones No. 1,441,685 (Defts. Exh. 144, R. 720, 1343-5) called for three parts sand (i.e., silica) and one part lime (i.e., calcium oxide) (R. 1344, lines 52-58), which under the heat of the arc produce a flux consisting chiefly of calcium silicate.

Armor No. 1,467,825 (Defts. Exh. 145, R. 720, 1346) used silicates of aluminum, iron and manganese (R. 1346, lines 43-55).

(Continued on following page)

Additionally, as will be recalled, Robinoff had used a clay flux which is chiefly aluminum silicate (R. 507, 310). Robinoff, however, did not seek a patent for his aluminum silicate flux because he was:

> "aware of the fact that the ingredients of protective coating were broadly covered by other patentees" (Pltf. Exh. 227, R. 543, 897).

The result of the trial court's reading of the patent in suit is that the flux which Robinoff could not patent, is added to the monopoly of Linde.

(ii) Manganese Silicate Disclosed by Miller.

Not only is the manganese Lincoln used, which now has been written into Linde's patent, not an alkaline earth metal (Finding 12, R. 925), but its use as a welding flux was disclosed by the prior and now expired Miller patent, No. 1,754,566 (Defts. Exh. 145, R. 720, 969).[12] The trial court, to be sure, thought that the alkaline earth metal silicate claims of Jones, if expanded to embrace manganese silicate, were not anticipated by Miller (R. 920-1). But the trial

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[12] There are three Miller patents. The *first*, No. 1,741,031 (Defts. Exh. 145, R. 720, 1347), issued in 1929; the *second*, No. 1,748,785 (Defts. Exh. 145, R. 720, 1349), issued in 1930; and the *third*, now under discussion, No. 1,754,566 (Defts. Exh. 145, R. 720, 969), likewise issued in 1930. All relate to fluxes for use in electric arc welding.

(Continued from preceding page)

Miller No. 1,741,031 (Defts. Exh. 145, R. 720, 1347-8) used "borosilicate glass, such as the sodium glass" (R. 1347, lines 57-8) and taught also that "The alkaline earth oxides may replace the alkali metal oxides in whole or in part" (R. 1348, lines 10-11).

Miller No. 1,748,785 (Defts. Exh. 145, R. 720, 1349-50) used "2 to 4 parts of ordinary borax and one part of silica, both materials being preferably in a finely divided form and thoroughly mixed before fusion. The fusion of the two substances is desirably continued until a homogeneous melt results" (R. 1349, lines 48-53).

Miller No. 1,754,566 (Defts. Exh. 145, R. 720, 969) taught the use of manganese silicate (R. 969, lines 27-8, 53-64).

court reached this conclusion by applying to Miller a mistaken rule of law. It supposed the teachings of a patent, as anticipatory art, limited to the preferences therein expressed. But, as this Court has often held, the disclosure of a patent for anticipatory purposes, is not so limited. The disclosure embraces *all* that the patent, including its specification, makes known, whether as a preferred form of the invention or not, and even if not set forth in the claims.[13] The trial court's conclusion, therefore, although seemingly a finding of fact, rests upon plain error of law.

The trial court's ground of distinction was that Jones required the materials to be "prefused or reacted" (R. 921), whereas Miller, although disclosing the use of prefused manganese silicate, did not teach prefusion as the *preferred* form of his invention. The trial court therefore concluded the "Miller patent did not teach all that the Jones, *et al.* patent does" (R. 920-1).

Whether Lincoln used the preferred form of the invention is immaterial. Miller having disclosed it, Jones could not (and did not) claim it.

For that matter, prefusion of the ingredients was not new with Jones.

(iii) Prefusion Likewise Old.

The desirability of prefusing the ingredients of the welding flux, so that all reactions which would evolve deleterious amounts of gases during welding would be completed, was well known prior to Jones. What the patentees did was to adopt the prefusion disclosed by Miller and taught by others as well. Thus:

> Miller in his first patent No. 1,741,031 (Defts, Exh. 145, R. 720, 1346-7), taught "The flux • • • should *not* evolve such quantities of gases, as by decomposition of its constituents or reaction

[13] Miller's claim covered welding "under a molten slag containing manganese silicate" (R. 971, col. 1, lines 35-6).

among them, that the flux puffs or froths away from the surface of the molten metal. * * *

I have found that the above requirements are met in admirable fashion by a flux consisting of a borosilicate glass [i.e., a metallic silicate], such as the sodium glass. * * * The borosilicate glasses when *in the fused state* undergo relatively slight change in fluidity throughout a wide temperature range, and this property is one of the principal causes of their effectiveness when used as welding fluxes. * * *

If a preformed [that is, prefused] glass is used it *evolves no gases* upon heating, while if the glass is formed *in situ* the reacting materials can be such that gases are not evolved" (R. 1347, lines 38-78).

Miller's second patent No. 1,748,785 (Defts. Exh. 145, R. 720, 1346, 1349), also taught prefusion of the ingredients. It called for prefused boro-silicate glass (R. 1349, lines 45-54). The patent taught preparation of the flux "*by fusing together*" specified materials "preferably in a finely divided form and thoroughly mixed before fusion. The fusion of the two substances is desirably continued until a homogeneous melt results" (R. 1349, lines 47-53).

Miller's third patent No. 1,754,566 (Defts. Exh. 145, R. 720, 969) as has been seen, disclosed prefusion in pointing out that "Instead of preformed [that is, prefused] manganese silicate," the ingredients could be fused *in situ*, permitting "one operation to be dispensed with" (R. 969, col. 2, lines 65-71).

Armor patent No. 1,467,825 (Defts. Exh. 145, R. 720, 1346), disclosed an arc welding composition which included a large percentage of clay, i.e., aluminum silicate, and a substantial amount of manganese

dioxide. It taught prefusion of the ingredients. They "are *preferably fused* together and then pulverized" (R. 1346, col. 2, lines 58-9).[14]

Of this prior art the patentees were unaware. "I never had heard of the Miller patent" (R. 76); "we knew nothing whatever about electric welding fluxes" (R. 60).

Discovery of Patentees.

In order to read with understanding claims 18, 20, 22 and 23, now before the Court, and to determine their proper scope, the Court must know what it is the patentees invented.

—What Patentees Sought.

The patentees, as the trial court noted, sought "an improved welding composition or flux" for use in Robinoff's submerged arc process (R. 912).

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[14] Likewise the Vervaet patent of 1903 and the Whitcomb patent of 1883, which related to forge welding, taught prefusion of the ingredients. Thus:

Vervaet patent No. 720,300 (Defts. Exh. 146, R. 720), taught prefusion of the flux ingredients. To effect this the ingredients "are placed, according to the preferred manner of following my method, in a crucible together and then heated to a degree of temperature which, being above that of the melting-point of the glass [i.e., sodium-boro-silicate glass, a metallic silicate], is sufficient to reduce both to the molten condition [thus fusing the ingredients]" (Lines 23-78).

Whitcomb patent No. 277,393 (Defts. Exh. 142, R. 720, 1325), relating to a flux composed largely of fluorspar, a naturally occurring calcium fluoride, taught the addition of materials to "prevent the generation of deleterious gases" (R. 1325, col. 1, lines 29-30) and pointed out that "if * * * the water of crystallization be driven off" [which can be effected only by fusing the material], the compound is adapted to be used in the usual manner, by placing it on the parts to be brazed or welded in the manner usually employed with other substances now used for like purposes" (R. 1325, lines 31-8).

At Western Pipe and Steel Company in San Francisco, the patentees saw the Robinoff process in operation (R. 29). But the welds were not satisfactory (R. 30). They contained bubbles or holes (R. 31). The flux in use was 89% clay, chiefly aluminum silicate (R. 30, 310). The patentees being without knowledge of the prior art use of welding fluxes (R. 60) concluded that the difficulty with the Robinoff process as there practiced[15] resulted from the evolution of gas in the welding operation (R. 34; Finding 6, R. 924). This they set out to cure.

—What Patentees Used.

To avoid the difficulty the patentees found in their use of the Robinoff process, they prefused the ingredients (Finding 6, R. 924). In this they were following the prior art.[16] They tried out various materials.

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[15] The clay or aluminum silicate in use at Western Pipe and Steel *contained 8.94% water* (Pltf. Exh. 128, R. 31, 879, 884). Robinoff, however, using the same flux, heated it to drive off the water (R. 514-5). He produced over 1000 miles of welded pipe at the National Tube Company's plant in Pittsburgh (R. 521). In demonstrating Robinoff for the trial court respondent used a clay flux containing 7.5% water (Pltf. Exh. 151, R. 230, 883). The flux demonstrated was not heated (R. 126). The patentees' notes show that when they heated the clay to the melting point, thus eliminating the water, the results were good (flux 21, test 138, Defts. Exh. 88, R. 425, 1153, 1206, 1207).

[16] See pages 14 to 16, *supra*. The Court of Appeals, to be sure, speaking of the process now held invalid and misreading the prior art, said "Plaintiff's process was quite different from that of the prior art disclosures in that the latter depended on the evolution of more gas to protect the molten metal, while plaintiff's proceeds on the theory of eliminating all gas forming ingredients" (R. 1002). The conclusion of the Court of Appeals in this respect is without any support in the record. Note that the:

Trial court entertained no such views about the prior art;

Patentees in the specifications of the patent, always referred to by Linde as "a most complete disclosure of the prior

(Continued on following page)

The identity of the specific materials the patentees used and the results attained with each are not presently important. But it *is* important for an understanding of the sentence in the specification which the trial court read into the claims to note, in general, the course of experimentation the patentees followed. The meaning of the sentence in the specification, which the trial court misread and on which it rested the judgment of infringement, will then be plain. The sentence, it will be remembered, is this:

> "We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions" (R. 920).

Specifically, the patentees tried out in 465 tests, 69 different fluxes (Defts. Exh. 88, R. 425, 1153). Of these six were not silicates. All were unsatisfactory. Accordingly nothing was claimed for them in the patent. Of the remaining 63 fluxes containing silicates, **57 contained calcium silicate either alone, or "in binary and ternary combinations" with one or two of the other silicates** named in the sentence in the specification above quoted. Of these 57 fluxes which contained calcium silicate:

51 contained calcium silicate "in major proportion." Of these 51 fluxes:

(Continued from preceding page)

art," give no hint that prior teaching was confined to the evolution of more gas;

Prior art patents included in the record, covering fluxes contain no materials designedly incorporated in the flux to generate gases and many expressly teach the elimination of gas (Defts. Exhs. 144, 145, R. 720, 1335-54).

In the case of one type of coated electrodes, materials designed to generate inert gases to further shield the arc zone have been included along with slag-producing silicates (R. 444). However, this does not mean that all the prior art taught "gas." It did not. Profusion the patentees did teach. But, so did many others before them.

20 consisted primarily of calcium silicate.[17]

31 consisted of calcium silicate in "major proportion," together with one or two of the following silicates: sodium, iron, manganese, magnesium [i.e., "in binary and ternary combinations, in various proportions"],[18] all

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[17] The fluxes containing calcium silicate as the sole silicate ingredient were fluxes 40, 44-6, 52-3, 60-3, 66-7; 69 (R. 1158, 1161, 1231). The results showed "Holes clear through" (R. 1231); "plenty holes because are uncovered" (R. 1233). The inventors' notes are replete with reports of "holes" (i.e., tests 319, 328-9, 334-5, 337, 341, 359-62, 354-5, 378, R. 1236, 1238-40, 1243-4, 1246). Fluxes 1, 9, 11 were blast furnace slags, consisting primarily of calcium silicate. These contained undesirable impurities (R. 61, 834). Flux 58 consisted of calcium silicate and aluminum, and fluxes 37, 42, 54 consisted of calcium silicate plus boric acid or boric oxide. These boron-containing fluxes produced cracks (R. 38). The patentees advised the Patent Office "Boron compounds in large proportion do not appear to be advantageous" (R. 1078).

[18] The patentees' notes, which constitute the complete record of the inventors' experiments (R. 63), show they used *calcium silicate and* one of the following silicates (i.e., in "binary • • • combinations"):

Sodium silicate in fluxes 4, 18, 35-6, 55 (R. 1153, 1155, 1157, 1161). The results were uniformly unsatisfactory. This series ended with flux 55 (R. 1161) in test 340 (R. 1240) with the conclusion "Sodium gives round holes" (R. 1241).

Iron silicate in fluxes 10, 20, 38-9, 43, 43F, 59 (R. 1155, 1157-8, 1162). The patentees advised the Patent Office "the results obtained with iron-bearing silicates have not been satisfactory" (second application, Pltf. Exh. 126, R. 26, 1074, 1078).

Magnesium silicate in fluxes 3, 57A, 64, 68 (R. 1161-2). In flux 68 the patentees found the specific combination of calcium and magnesium silicates, to which calcium fluoride was added, which gave them the desired results (test 422, R. 1255) and which constitutes their invention (R. 38-9).

In their "ternary combinations" they used *calcium silicate and*:

Sodium and iron silicates in fluxes 12, 14, 16-7, 19, 22-3, 30-3, 33A, 49 (R. 1155, 1157-8).

Magnesium and manganese silicates in fluxes 72, 73 (R. 1163).

(Continued on following page)

of which appear in the specification as above noted in the sentence which the trial court's construction reads into the claims. Some were efficacious; some were not.[19]

6 contained calcium silicate, although not in major proportion, in combination with silicates of sodium, iron, magnesium and aluminum.[20]

6 did not contain calcium silicate.[21]

In the light of these experiments it is at once evident that the specification is, as it purports to be, merely a summary by the patentees of their experiments. It is equally clear that this record contradicts the trial court's interpretation of the language of the specification. Note that the specification does not say—as a matter of reading English—what the trial court thought it said. The specification says:

"We have used *calcium silicate and* silicates of sodium, barium, iron, manganese, cobalt, magnesium,

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[19] The Court of Appeals (R. 1001), as did this Court, 336 U. S. 271, 276, thought *each* of these nine silicates had been proved operative. The trial court did not so find. As will be seen, it was by misreading what the trial court said—in construing the language of the patent and not as a finding of fact—that each of these nine silicates was by the Court of Appeals and this Court (but not by the trial court) assumed to be operable. Actually the trial court *found only four* of them operable. The proof is on pages 69 to 71. However, for the moment it is enough to note merely that some of these combinations produced satisfactory welds and that others did not.

[20] The patentees used calcium and sodium silicates in fluxes 3 and 7 (R. 1153); calcium and magnesium silicates in fluxes 51 and 56 (R. 1161); calcium and aluminum, sodium and iron silicates in fluxes 15 and 21 (R. 1155).

[21] Flux 48 (R. 1158) consisted of sodium silicate; fluxes 41, 47, 50 (R. 1158) consisted of iron silicate; fluxes 70 and 70.1 (R. 1162, 1255) consisted of manganese silicate.

(Continued from preceding page)

It will be observed that the inventors ran no tests on three of the nine, barium, cobalt, nickel. However, Kennedy testified the patentees had used barium successfully (R. 126) and the trial court so found (R. 917).

nickel and aluminum, both in binary and ternary combinations, in various proportions [that is, they say they have used, *not each* of the nine silicates, as the trial court supposed, but calcium silicate *combined with one or two of the other silicates* mentioned, which, as has been seen, their notes show is precisely what they did use]. * * * While a number of these * * * are more or less efficacious [note that, contrary to the trial court's reading of this language, the patentees do not say *all* of the nine are more or less efficacious, but only that "a number of" them (that is, *some* of them, but not all) are more or less efficacious—meaning, plainly enough, that some are not efficacious at all, but that of the "number of" them which *are* efficacious, some are *more* efficacious than others—which, again, is precisely what the patentees' notes show] * * * we prefer to use [which again is what their notes show] silicates of the alkaline earth metals, such as calcium silicate" (patent, R. 956, col. 1, lines 62-72).

Obviously, what the trial court misread, then wrote into the claims, is merely a report by the patentees of the experiments which led to the invention described in the claims.

—What Patentees Discovered.

As a result of these experiments the patentees, as the trial court noted, "discovered what they sought" (R. 912). Note that the trial court held:

(i) They Discovered a Specific Flux.

The patentees discovered a specific flux or fluxes which, used in the Robinoff process, produced improved results (Findings 7, 15, 27, R. 924-5, 927). "It is evident that the welding composition discovered by the inventors is the heart of the invention," said the trial court (R. 915).

(ii) It Comprised Calcium-Magnesium Silicates.

The patentees, having tried out various combinations of silicates:

"ultimately got down to calcium silicate, and then added a new component, a basic component, magnesium, and *so we came up with a calcium magnesium silicate*" (R. 38),

to which they added a small amount of calcium fluoride to lower the melting point.[22] "So we concluded," said Kennedy, one of the patentees:

"that we had performed sufficient experiments *on calcium magnesium silicate*, to have a commercial and usable flux" (R. 39).

The trial court agreed. The Linde flux, the trial court found, is:

"a silicate of calcium and magnesium with a little aluminum, and with calcium fluoride" (R. 919).

Commercially this is known as Unionmelt 20 and is the flux Linde demonstrated to the trial court (R. 107). It is the flux on which Linde's commercial success is based (Finding 9, R. 925).

It is described specifically in claims 29 and 10, and generally in claims 28, 25, 19, 21, which are not charged as infringed[23] (R. 17).

—What Patentees Claimed.

In the patent as it issued, the patentees claimed four categories of flux claims. Each succeeding group is *broader* than the preceding one. Thus:

Claims 29, 10, 28, 25, 19, 21, which are not charged as infringed, define the *specific* discovery of the patentees. They cover the calcium magnesium sili-

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[22] The use of calcium fluoride for this purpose "is well known metallurgically" (R. 89). The patentees "did not claim to have first discovered the property" (R. 90).

[23] Claims 29 and 10, not charged as infringed, describe the only flux which meets the description given in the specification of "**Welding compositions which have been used successfully**" (R. 956, col. 2, lines 64-75). See appendix, p. 75.

cate flux on which Linde's commercial success is based (Finding 9, R. 925).

Claims 18, 20, 22, 23, now before the Court, cover all fluxes "containing a major proportion of alkaline earth metal silicate." Thus, these claims[24] cover not only the calcium and magnesium silicate fluxes which are defined in the preceding group of claims, but cover *in addition* fluxes composed in major proportion of either of the two remaining alkaline earth metal silicates, namely, strontium and barium (Finding 11, R. 925).

Claim 24, still broader, covers all "metallic silicate" fluxes. Because "Many silicates, even many metallic silicates, are inoperative" (Finding 17, R. 926), this claim was held broader than the invention. Since it is the claim that measures the grant, this Court held the claim could not be saved by reading the specifications into it so as to limit it to the nine silicates named in the specification.

Claim 26, broader still, covers all "silicates." This claim, likewise, was held invalid, for the same reason as the preceding one.

The point to note from all this is that the discovery of the patentees is covered and protected by claims 18, 20, 22, 23, which this Court has held, and which now are assumed to be, valid. But the reading put upon these claims, to find infringement, expands them to cover something beyond the plain words of the grant, as next will be pointed out.

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[24] Claim 18 names a single ingredient, viz., "a major proportion of alkaline earth metal silicate." Claims 20, 22, 23 call for "a major proportion of alkaline earth metal silicate" and *one additional ingredient*, in unnamed proportion, namely "a fluoride" or "calcium fluoride." (See appendix, p. 77.) This has had a long use in fluxes to lower the melting point (R. 89-90).

—What Judgment Gives Patentees.

This Court held upon the prior review that the words of the specification:

> "We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum" (R. 956, col. 1, lines 62-4)

cannot be read into claims 24 and 26, to narrow them (in order to save the claims). Manifestly, if this language cannot be used to *narrow* the one group of claims, it cannot be used to *expand* the other group, 18, 20, 22, 23, presently under discussion. But that is what the trial court did. That is the sole basis of the judgment of infringement. The result is that Linde, in defiance of the grant, has added to its monopoly:

Miller's manganese silicate, which Lincoln used, and which rightfully is in the public domain;

Robinoff's aluminum silicate (because it, too, along with manganese silicate, is in the list of nine) which likewise is in the public domain;

All combinations, in major proportion, of each of the remaining silicates in this list of nine metallic silicates; which being disclosed, but not claimed, are, under this Court's decisions, in the public domain;

Equivalents, presumably, of each of these nine.

Thus, a patent unambiguously limited to fluxes "containing a major proportion of alkaline earth metal silicate" and now held valid, is made to cover what admittedly is not an alkaline earth metal silicate. In the process much that is public property, as may be seen from the diagram in the appendix, p. 79, must pass to Linde. But, more important, the industry—that is, the public—is put in doubt, perplexing and unresolvable save by litigation, concerning the ultimate reach not only of this patent but of others yet to come to which the same principle of construction may be expected to be applied.

SPECIFICATION OF ERRORS.

The Court of Appeals erred:[25]

1. In holding infringed composition claims 18, 20, 22 and 23 of Jones patent No. 2,043,960 and in affirming the judgment of the District Court with respect thereto.
2. In expanding said claims to embrace the specifications.
3. In interpreting said patent to hold manganese silicate an equivalent of alkaline earth metal silicates claimed in said patent.
4. In refusing to hold the claims of said patent anticipated, if so expanded.
5. In treating findings of fact as conclusions of law and treating conclusions of law as findings of fact.

SUMMARY OF ARGUMENT.

I. The claims measure the grant. They cannot be expanded either by reading specifications as claims or by any doctrine of equivalents:

1. The judgment of infringement rests not on facts found, for the facts as found show there is no infringement, but upon three-fold error of law (see pp. 28 to 37).
2. Manganese silicate, which Lincoln used, was knowingly excluded by the patentees from their claims (see pp. 37 to 42).

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[25] The errors assigned are taken from the original specification of errors (see petitioner's opening brief upon the prior review, pp. 30-1), with so much modification in language as is necessary to confine the assignments to the infringement issue now remaining. The errors now assigned were, upon the prior review, numbered 3, 8, 9, 11 and 12, respectively. They derive from questions 2, 6, 7, 9, 10, presented in the petition for writs of certiorari (p. 16 of Petition).

3. To now read manganese silicate into the claims, by any rule, would be to reissue the patent in a manner forbidden by the reissue statute (see pp. 43 to 44).

II. Doctrine of equivalents applied to expand claims has no place in patent law, has been undermined by this Court's cases, and should be expressly repudiated:

1. The rule conflicts with the principle that the claim is the measure of the grant (see pp. 45 to 46).
2. It rests upon a view the subsequent cases of this Court reject. It had a brief life-span of 39 years in this Court, but in the last half century has not in this Court been applied to expand the claims of a patent (see pp. 46 to 59).
3. The doctrine, as a tool for expanding patent claims, should be expressly repudiated (see pp. 59 to 60).

III. If rule of equivalents still has vitality the doctrine, no matter how broad, cannot enlarge claims to cover manganese silicate. To do so would be to recall from the public domain prior patented and unpatented fluxes:

1. The trial court found equivalency, but only by a two-fold mistake of law. It misread the specification, then wrote the specification, so misread, into the claims. In both respects the trial court committed clear error of law. The result is to give to Linde, in the name of equivalents, a patent it did not, and could not, claim (see pp. 61 to 67).
2. The result of the trial court's rule of equivalents is to expand the patent into invalidity by writing into it (a) inoperable as well as operable compounds, (b) others requiring further test to determine whether they are operable or not, and (c)

others, including the manganese Lincoln used, which can be deemed equivalents only by doing violence to the express language of the patent (see pp. 67 to 72).

ARGUMENT.

I. CLAIMS MEASURE GRANT—THEY CANNOT BE EXPANDED EITHER BY READING SPECIFICATION AS CLAIM OR BY ANY DOCTRINE OF EQUIVALENTS.

The four claims, 18, 20, 22, 23, now before the Court, are limited to fluxes "containing a major proportion of alkaline earth metal silicate." So long as it is law that the claim measures the grant, as this Court held in overthrowing claims 24 and 26, claims limited expressly, as are these, cannot be infringed by a flux which admittedly, as the trial court found, is not an alkaline earth metal silicate. Otherwise the patent is made to cover something which the patentees, if they invented, did not "particularly point out and distinctly claim."[26] 35 U. S. C. § 33. Manifestly, therefore, any doctrine of equivalents, if it is not to destroy the congressional command, must be one which, no matter what its scope, restricts the patent to that which the patentees have not only invented but have also particularly pointed out and claimed.

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[26] "If it is desirable that the inventor secure an exclusive right in his invention, it is equally essential that his privilege shall not trespass upon what is not his. He has no claim to the prior art, to any antecedent scientific discovery, to any bit of technology which lies to right or left. That which is his contribution needs, as a condition of the grant, to be sharply separated from all to which it is related. Unless that is done, the patent owner may assert a private claim to some part of the fund of common knowledge; he may assert a monopoly over techniques which all members of the industry are legally free to use." 13 LAW AND CONTEMPORARY PROBLEMS, Duke University, pp. 245, 256, "*What Is a Patent?*" by Walton Hamilton and Irene Till.

However, because this Court's affirmance of the judgment of infringement rests, not upon a doctrine of equivalents, but upon plain error of law, it will be well to note first why that judgment can in no event stand.

1. The Error in Prior Judgment—It Rests upon Plain Mistake of Law.

This Court upon the prior review, as the opinion shows, affirmed the judgment of infringement because it mistakenly supposed the judgment grounded upon a question of fact. In truth the facts were found the other way. The conclusion of infringement followed, not from the facts found, but from threefold error of law:

—(a) Infringement Found Solely by Reading Specification as Claim.

The trial court agreed that the Lincoln flux does not infringe the claims as written (R. 919-20). However, the trial court declared infringement because:

> "In the patent [that is, in the specification, R. 956, col. 1, lines 62-5] the inventors state, 'We have used * * * manganese'" (R. 920).

Accordingly, the trial court found:

> "Manganese silicate is one of the nine metallic silicates *which the specification discloses* that the inventors have used as principal constituents in welding compositions attaining more or less effectively the objectives of their invention" (Findings 13, 14, 24, R. 925, 927).

Thus because manganese silicate is named in the specification, the trial court read claims 18, 20, 22 and 23 to cover not only the alkaline earth metal silicates, to which these claims are confined, but expanded them to embrace also manganese silicate which is not claimed. But the specification cannot so be used to enlarge a claim. This Court so held in declaring claims 24 and 26 invalid. This Court said:

"The statute makes provision for specification separately from the claims and requires that the latter 'shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery.' R. S. § 4888, as amended, 35 U. S. C. § 33. It would accomplish little to require that claims be separately written if they are not to be separately read. While vain repetition is no more to be encouraged in patents than in other documents, and claims like other statements may incorporate other matter by reference, their text must be sufficient to 'particularly point out and distinctly claim' an identifiable invention or discovery. We have frequently held that it is the claim which measures the grant to the patentee. See, for example, *Milcor Steel Co. v. Fuller Co.*, 316 U. S. 143, 145; *General Electric Co. v. Wabash Co.*, 304 U. S. 364, 369; *Altoona Theatres v. Tri-Ergon Corp.*, 294 U. S. 477, 487. While the cases more often have dealt with efforts to resort to specifications to expand claims, it is clear that the latter fail equally to perform their function as a measure of the grant when they overclaim the invention. When they do so to the point of invalidity and are free from ambiguity which might justify resort to the specifications, we agree with the District Court that they are not to be saved because the latter are less inclusive. *Cf. General Electric Co. v. Wabash Co.*, 304 U. S. 364, 373-374; see *McClain v. Ortmayer*, 141 U. S. 419, 424-425; *Cimiotti Unhairing Co. v. American Fur Refining Co.*, 198 U. S. 399, 410" (336 U. S. 271, 277).

What this Court thus declared *could not* be done (with respect to claims 24 and 26) it *did* do (with respect to claims 18, 20, 22 and 23). The Court arrived at this result by failing to note that the trial court's judgment of infringement rests not upon a finding of fact but turns solely and entirely upon a point of law.

That the trial court's judgment of infringement rests upon a point of law, its opinion makes clear. It found infringement only by expanding the claims to make them cover a composition admittedly not covered by the claims

as written. Accordingly, because it was dealing with a question of law and not of fact, the trial court declared the infringement, not as a finding of fact, but as a conclusion of law (Conclusion 4, R. 928).

The trial court thus understood it was ruling on a point of law—namely, the measure of the grant—whereas this Court affirmed as though the judgment of infringement rested upon facts found. The facts found show no infringement; if to those facts be applied the rule of law this Court applied to flux claims 24 and 26, and has always applied, there can be no infringement.

The vice of the construction by which the judgment of infringement is affirmed is that it expands the claims by resort to the specification in the teeth of the Court's assertion that this may not be done. Not only does the judgment of affirmance mutilate the law in this respect, but its *effects will be far-reaching. If the manganese* silicate Lincoln used is to be picked from the list of nine in the specification, and read into the claims, so also must each of the remaining eight. As a consequence, many fluxes now in the public domain must likewise infringe the present patent.

Moreover, new uncertainty is introduced into the patent law. The public no longer can rely on the claims of the patent as written to define, like the metes and bounds of a deed, the area from which it is excluded. It must speculate whether, and, if so, how much of, the specification is to be read as a claim. This risk not many will care to assume. The result will be that by deft use of specifications, operating *in terrorem*, otherwise clear-cut claims can be used to exclude the public from an additional penumbral area to which the patent owner in law has no title.

This Court noted:

> "He [the trial judge] concluded that what was really invented was that which was claimed and bounded by the composition claims Nos. 18, 20, 22 and 23" (336 U. S. 271, 274).

These claims have now been held valid. They, along with the claims not in issue, give the patentees every protection to which they are entitled. Linde retains a monopoly on the flux it has successfully exploited (Finding 9, R. 925). There is no call to expand that monopoly beyond the terms of the grant.

—(b) Fact Findings Misread—As a Result Lincoln Flux Mistakenly Assumed Same.

This Court upon the prior review mistakenly assumed:

> "the District Court found that the Lincoln Electric Co. made, and the other petitioners used and sold, a flux substantially identical with that set forth in the valid composition claims" (336 U. S. 271, 275).

The District Court did *not* so find.

—Trial Court Found Only Result Same.

The trial court did not find the accused flux was "substantially identical." It found:

> "The two compositions are identical *in operation*, and the same kind of weld is produced by them" (R. 919); and
>
> "The accused Lincolnweld flux and the composition of the patent in suit are substantially identical *in operation* and *in result*" (Findings 20, 21, R. 926).

They are not the same and the trial court did not so find.[27] They are merely the same "in operation and result."

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[27] One is an alkaline earth metal; the other is not (Findings 11, 12, R. 925). Moreover, manganese silicate used as a flux, as the trial court found, induces manganese into the weld metal (R. 919), a desirable result (R. 283). Manganese "results in * * * an improvement in the properties of the metal" (R. 283). Although the patent is silent on the necessity of doing so, respondent Linde in practice has with its flux used a special electrode (R. 685-6) containing 1% to 2% manganese (R. 688). "Manganese is probably one of the most outstanding elements * * * in regard

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—Patent Cannot Issue Upon Result.

A patent cannot cover a result. There may be many compositions—many may still be unknown—which will produce the same result. The patentees have claimed a specific group of silicates; it does not follow that any other producing the same result infringes.

The District Court was wrong in holding these claims infringed in view of the express finding that the "means" employed, viz. petitioners' manganese silicate, were different from the means, viz. alkaline earth metal silicate, to which the claims are restricted. "That two machines produce the same effect, will not justify the assertion that they are substantially the same, or that the devices used by one are, therefore, mere equivalents for those of the other," *Burr v. Duryee* (1863), 1 Wall. 531, 572; *Eames v. Godfrey* (1863), 1 Wall. 78, 80. The point is, as the Court observed in *Westinghouse v. Boyden Power Brake Company* (1898), 170 U. S. 537, 562, 569, 571, "Conceding that the functions of the two devices are practically the same, *the means used* in accomplishing this function are so different that we find it impossible to say, even in favor of a primary patent, that they are mechanical equivalents." Here, as in *Hubbell v. United States* (1900), 179 U. S. 77, 86, "What we have to consider is not whether the end sought to be effected is the same, *but whether the* devices or mechanical *means* by which the desired result is secured are the same."

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to its imparting of good physical properties to steel" (R. 688). This is a characteristic not claimed to have been discovered by the patentees but long before them "well known" (R. 688). Manganese serves a further purpose. As will be recalled, oxygen, combining with carbon, forms a gas (R. 459). The result, if the gas does not escape before the metal solidifies, is a bubble or hole in the hardened metal (R. 459). Manganese, however, has great avidity for oxygen (R. 664). Oxygen, given a choice, will unite with manganese in preference to carbon (R. 459). Oxygen, thus combining with manganese, forms, not a gas, but a solid (R. 459). Result: no holes.

The effect of the holding of infringement is to give to "alkaline earth metal silicate," which is the crucial element in the claims, a functional definition. Thus any compound "substantially identical in operation and in result" would infringe. Functional identity, even where the means which produce the result have been found not the same, would mean infringement. Had the material of the claims been defined in such functional terms, the claims would have been held invalid as a violation of the statute, 35 U. S. C. § 33. *Case v. Brown* (1864), 2 Wall. 320, 328; *Holland Furniture Company v. Perkins Glue Company* (1928), 277 U. S. 245, 256-8; *General Electric Co. v. Wabash Appliance Corp.* (1938), 304 U. S. 364, 370-1; *United Carbon Co. v. Binney & Smith Co.* (1942), 317 U. S. 228, 234; *Halliburton Oil Well Cementing Co. v. Walker* (1946), 329 U. S. 1, 9, 12. Here as a result of this Court's adoption of the trial court's mistaken conclusion, on the assumption it was a finding of fact, "the broadness, ambiguity and overhanging threat of the functional claim," thus constituted, of each of the four claims in issue become apparent, just as much as in the *Halliburton* case.

In short, the trial court on the issue of infringement found three facts: The accused flux is a manganese silicate. Manganese silicate is not an alkaline earth metal silicate. Manganese silicate as used produces the same result as an alkaline earth metal silicate. The first two facts repel the thought of infringement. The third affects only the result and results as such are never patentable.

—(c) Conclusion Lincoln Flux Derived from Jones Misreads Miller's Prior Patent.

In affirming the judgment of infringement, this Court added:

> "The petitioners introduced no evidence to show that their accused flux was derived either from the prior art, by independent experiment or from any source other than the teachings of the patent in suit" (336 U. S. 271, 276).

The trial court did so find (R. 920-1; Finding 22, R. 926). But this, while seemingly a finding of fact, rests upon the application to the prior and now expired Miller patent No. 1,782,316, of a rule of law this Court's cases condemn.

First. Miller taught and claimed the use, for arc welding purposes, of manganese silicate. That is what Lincoln used (R. 919; Finding 21, R. 296). Indeed, "the primary object" of the Miller patent was to provide:

> "a blanket of molten manganese silicate" (Miller patent, R. 969, col. 1, lines 43-4).

The trial court, however, thought—and fell into plain error of law—that Jones, if construed to cover the manganese silicate mentioned in the specification, was not anticipated by Miller.

Why?

Because Jones required the constituents to be "prefused or reacted" (R. 921) whereas Miller, although disclosing the use of prefused manganese silicate, pointed out that:

> "Instead of preformed [that is, prefused] manganese silicate the coating may contain material adapted to react at the temperature of the metal-depositing operation to produce manganese silicate. This is the preferred form of the invention *as it permits one operation to be dispensed with*" (R. 921; Miller patent, R. 969, col. 2, lines 65-71).

Thus, Miller *disclosed* the use of prefused manganese silicate and only recommended fusion of the ingredients *in situ* to dispense with one operation. That prefusion was not the preferred form of his invention is immaterial. He disclosed it; many others taught it.[28] The trial court's error

[28] See, for example, the two other Miller patents and Armor, Vervaet, and Whitcomb (pp. 14 to 16, *supra*, and note 14, p. 16), and compare them with the rule declared in *Mandel Brothers, Inc. v. Wallace* (1948), 335 U. S. 291. If, as in *Mandel*

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lay in limiting Miller, as anticipatory art, to his preferred form. But it cannot be so limited. *Minerals Separation North American Corporation v. Magma Copper Company* (1930), 280 U. S. 400, 402, 404; *Alexander Milburn Company v. Davis-Bournonville Company* (1926), 270 U. S. 390, 401. In determining anticipation, as the Court put it in the *Minerals Separation* case, 280 U. S. 400, 402:

> "The question is not what is the precise scope of the claims in 835120 [the prior patent], but what is disclosed in the specification and made known to the world."

Here, as there (p. 404):

> "The [prior] patent having been held good as to the oils although experiment was necessary to find out what oil would work best with a given ore, *the disclosure was an anticipation* although experiment might be necessary to choose among the substances having

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Brothers, application of old methods (of inhibiting corrosion) to a new use in a different field (in cosmetic preparations as an anti-perspirant) is not invention, manifestly use in the same field of the teaching of the prior art must likewise fail as invention. As *Ansonia Brass and Copper Company v. Electrical Supply Company* (1892), 144 U. S. 11, points out (p. 18), "nothing is better settled in this court than that the application of an old process to a new and analogous purpose does not involve invention, *even if the new result had not before been contemplated.*" To the same effect are: *Detrola Radio & Television Corp. v. Hazeltine Corporation* (1941), 313 U. S. 259, 269; *General Electric Co. v. Jewel Incandescent Lamp Co.* (1945), 326 U. S. 242, 248-9; *Altoona Publix Theatres, Inc. v. American Tri-Ergon Corp.* (1935), 294 U. S. 477, 486; *Paramount Publix Corp. v. American Tri-Ergon Corp.* (1935), 294 U. S. 464, 470, 473; *Smith v. Hall* (1937), 301 U. S. 216, 226, 232; *Cuno Engineering Corp. v. Automatic Devices Corp.* (1941), 314 U. S. 84, 90-1; *Powers-Kennedy Contracting Corporation v. Concrete Mixing and Conveying Company* (1930), 282 U. S. 175, 186; *Lovell Manufacturing Company v. Cary* (1893), 147 U. S. 623, 637; *Grant v. Walter* (1893), 148 U. S. 547, 556. As the Court noted in *Dow Chemical Co. v. Halliburton Oil Well Cementing Co.* (1945), 324 U. S. 320, 328, "He who is merely the first to utilize the existing fund of public knowledge for new and obvious purposes must be satisfied with whatever fame, personal satisfaction or commercial success he may be able to achieve."

the required affinity the one that would produce the best result."

Accordingly, the Court in the *Minerals Separation* case, held invalid a patent relating to the separation of ores because it was anticipated, not by the claims or preferred form of the prior patent, but by the disclosure made in the specification of the prior patent. Similarly here Jones, if read to embrace manganese silicate, is void as anticipated by Miller. *Miller v. Eagle Manufacturing Company* (1894), 151 U. S. 186, 198. The reason is, " 'that which infringes, if later, would anticipate if earlier.' " *Knapp v. Morss* (1893), 150 U. S. 221, 228.

Consequently, whether Lincoln in following the disclosure, although not the preferred form of Miller, can be branded an infringer of Jones, is necessarily a pure question of law. It turns solely on a reading of Miller. What the trial court overlooked was Lincoln's right, irrespective of Miller's indicated preference, to utilize the prefused manganese silicate Miller disclosed. And to affirm the trial court's erroneous conclusion, as this Court did upon the prior review, in the mistaken belief it was dealing with a question of fact, is to withdraw Miller from the public domain and add it to Jones.

Second. Even if Lincoln's flux came, not from the prior Miller, but from Jones, that would be immaterial. Either the accused flux infringes or it does not; and, if infringing, it could no more be saved by proof of independent discovery than it could be condemned, if non-infringing, by proof it was derived from the patent.[29] This

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[29] "If what the defendant is doing infringes, plaintiff should have its decree no matter whether defendant thought it up independently or got the idea from plaintiff's patent. If, on the other hand, what it does does not infringe, the fact that a knowledge of plaintiff's patent started defendant on the search for a device of its own will not entitle plaintiff to a decree." *Eastman Oil Well Survey Co. v. Sperry-Sun Well Surveying Co.* (5 C. C. A. 1942), 131 F. (2d) 884, 887; *F. N. Burt Co., Limited v. W. C. Ritchie & Co.* (E. D. N. Y., 1918), 251 Fed. 909, 921.

Court says so. "The public *has the undoubted right to use,* and it is to be presumed does use, what is not specifically claimed in the patent." *Mahn v. Harwood* (1884), 112 U. S. 354, 361. This is the rule flowing from the statute itself. The purpose of the statute in requiring the inventor to "particularly point out and distinctly claim" the invention is to free the public to build on the past.[30]

Manifestly the prior judgment of infringement cannot stand.

2. Jones, Having Excluded Manganese from Patent Claims, Dedicated it to the World.

The patentees not only declared:

> "we prefer to use silicates of the alkaline earth metals" (R. 956, col. 1, lines 71-2)

but coming to state their claims explicitly and unambiguously *limited* the invention, in claims 18, 20, 22, 23, now before the Court, to fluxes containing:

> "a major proportion of alkaline earth metal silicate * * * *"

The manganese silicate of the Lincolnweld flux—because it is not an alkaline earth metal silicate—was thus put outside the scope of the patent.

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[30] "The aim of the patent laws is not only that members of the public shall be free to manufacture the product or employ the process disclosed by the expired patent, but also that the consuming public at large shall receive the benefits of the unrestricted exploitation, by others, of its disclosures." *Scott Paper Co. v. Marcalus Manufacturing Co., Inc.* (1945), 326 U. S. 249, 255. See also: *Permutit Co. v. Graver Corporation* (1931), 284 U. S. 52, 60; *General Electric Co. v. Wabash Appliance Corp.* (1938), 304 U. S. 364, 372; *Universal Oil Products Co. v. Globe Oil & Refining Co.* (1944), 322 U. S. 471, 484; *Schriber-Schroth Co. v. Cleveland Trust Co.* (1938), 305 U. S. 47, 57; *Sontag Chain Stores Co., Ltd. v. National Nut Company of California* (1940), 310 U. S. 281, 293; *Muncie Gear Works, Inc. v. Outboard Marine & Manufacturing Co.* (1942), 315 U. S. 759, 768.

—(a) Manganese Was Knowingly Excluded from the Claims.

The exclusion of manganese silicate from the claims of the patent was purposeful. The patentees knew it was operable. They found out in their experiments that it would produce a good weld (Defts. Exh. 88, R. 425, 1153). They tried it in fluxes 70 and 70-1 (R. 1162) in tests 423-4 (R. 1255-6). And in the initial application for the patent they said:

> "there are other materials suitable to form the main body of the flux. Magnesium silicate, *manganese silicate*, or these in combination serve admirably" (Pltfs. Exh. 125, R. 26, 1043, 1048)

and that "Particular fluxes that we have used are . . . *Manganese silicate*" (R. 1051). However, after purchase of the patent application by Linde's parent, Union Carbide and Carbon Corporation, these references to the use of manganese silicate *were eliminated* when the second application was drawn (Pltfs. Exh. 126, R. 26, 1074). These references to manganese silicate were not repeated in the third application (Pltfs. Exh. 127, R. 26, 1103) on which the patent ultimately issued, nor do they appear in the patent (R. 969). Moreover, no claim was ever drawn specifically covering manganese silicate.

The exclusion of manganese silicate from the claims was, therefore, purposeful. The reason is obvious. Miller stood in the way. But, if not, and if mistake of the scrivener merely, the result is the same. In either case the consequence the law imposes is that manganese silicate, even if within the invention and not barred by Miller, was, by the patentees' failure to claim it, dedicated by them to the world. And they cannot now ask this Court to write into the patent, in the name of equivalents, a composition which they knowingly forebore, for reasons good or ill, from *claiming* as a part of their invention.

—(b) Result Is That Manganese Silicate, Even If Patentable, Is Excluded From Jones.

Manganese silicate having been thus excluded from the claims—if it was part of the invention—belongs to the world:

Mahn v. Harwood (1884), 112 U. S. 354, 360-1;
McClain v. Ortmayer (1891), 141 U. S. 419, 423-4;
Deering v. Winona Harvester Works (1894), 155 U. S. 286, 296;
Altoona Publix Theatres, Inc. v. American Tri-Ergon Corp. (1935), 294 U. S. 477, 487;
Sontag Chain Stores Co., Ltd. v. National Nut Company of California (1940), 310 U. S. 281, 293;
Miller v. Brass Company (1881), 104 U. S. 350, 352.

The rule is that "what is not claimed is public property." So held the Court in *Mahn v. Harwood* (1884), 112 U. S. 354, 361. As the Court pointed out (pp. 360-1):

"The taking out of a patent which has (as the law requires it to have) a specific claim, is notice to all the world, of the most public and solemn kind, that all those parts of the art * * * set out and described in the specification and not embraced in such specific claim, are not claimed by the patentee * * *."

The reason is that (p. 361):

"so far as that patent is concerned, the claim actually made *operates in law as a disclaimer* of what is not claimed; and of all this the law charges the patentee with the fullest notice."

The result is, as the Court added (p. 361):

"The public is notified and informed by the most solemn act on the part of the patentee, that his claim to invention is for such and such an element or combination, and for nothing more. Of course, what is not claimed is public property. The presumption is, and such is generally the fact, that what is not claimed was not invented by the patentee, but was known and used before he made his invention. But, whether so or not, his

own act has made it public property if it was not so before."

Consequently, even if manganese silicate now sought to be read into the claims were within the invention, and not barred by Miller's disclosure, the patentees themselves have effectively put it beyond the reach of their patent. They have dedicated it to the public.

As the Court put it, in *McClain v. Ortmayer* (1891), 141 U. S. 419, 423:

"While the patentee may have been unfortunate in the language he has chosen to express his actual invention, and may have been entitled to a broader claim, we are not at liberty * * * to construe such claims to include more than their language fairly imports. Nothing is better settled in the law of patents than that the patentee may claim the whole or only a part of his invention, and that if he only describe and claim a part, *he is presumed to have abandoned the residue to the public.* The object * * * is not only to secure to him all to which he is entitled, but to apprise the public of what is still open to them. The claim is the measure of his right to relief, and while the specification may be referred to to limit the claim, it can never be made available to expand it."[31]

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[31] The rule that the claim measures the grant, applied by this Court in holding claims 24 and 26 invalid, is firmly rooted. See, for example:

Keystone Bridge Company v. Phoenix Iron Company (1877), 95 U. S. 274, holding that patentees (pp. 278-9) "cannot show that their invention is broader than the terms of their claim; or, if broader, they must be held to have surrendered the surplus to the public."

White v. Dunbar (1886), 119 U. S. 47, holding that a claim confined to a lining of textile fabric (p. 51) "is tantamount to a declaration that they claimed nothing else."

Grant v. Walter (1893), 148 U. S. 547, holding (p. 554) "It is settled that distinct and formal claims are necessary to ascertain the scope of the invention" and "If, therefore, the elements of 'boiling off,' or ungumming the silk, or the dyeing thereof, and of improving the winding

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—(c) Disclosure in Specification of Manganese Is Immaterial.

The rule is the same even though the patentees in the specification said "We have used * * * manganese" (R. 956, col. 1, lines 62-4).[32]

The trial court, to be sure concluded "the invention includes compositions of those silicates mentioned [the nine named in the specification] and that the inventors found a number of them will accomplish the objectives of the patent

[32] The statement "We have used * * * manganese," without claiming it, "would have had the same effect * * * if Clifford [the patentee] had added to his description a statement *that he did not claim* the thing described because he abandoned it or because he believed it to be old." *Alexander Milburn Company v. Davis-Bournonville Company* (1926), 270 U. S. 390, 401.

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facility, were patentable, in view of the prior skeins, they should have been covered *by the claims* of the patent."

Merrill v. Yeomans (1876), 94 U. S. 568, holding (p. 573) "The public should not be deprived of rights supposed to belong to it, without being clearly told what it is that limits these rights."

Schriber-Schroth Co. v. Cleveland Trust Co. (1938), 305 U. S. 47, holding (p. 58) "If invention depends on emphasis of one quality over the other, as the court below found was the case with the laterally flexible webs in the Gulick device, the statute requires that emphasis *to be revealed* to the members of the public, who are entitled to know what invention is claimed."

Universal Oil Products Co. v. Globe Oil & Refining Co. (1944), 322 U. S. 471, holding (pp. 484-5) "The claim is required to be specific for the very purpose of protecting the public against extension of the scope of the patent."

Other important cases applying the rule that the patent cannot be enlarged beyond its claims are: *General Electric Co. v. Wabash Appliance Corp.* (1938), 304 U. S. 364, 369; *United Carbon Co. v. Binney & Smith Co.* (1942), 317 U. S. 228, 236; *Permutit Co. v. Graver Corporation* (1931), 284 U. S. 52, 60; *Burns v. Meyer* (1879), 100 U. S. 671, 672; *Yale Lock Manufacturing Company v. Greenleaf* (1886), 117 U. S. 554, 559; *The Incandescent Lamp Patent* (1895), 159 U. S. 465, 474; *Railroad Supply Company v. Elyria Iron & Steel Company* (1917), 244 U. S. 285, 294.

more effectively than others of the group" (R. 917). But this reading, as has been seen (pp. 20 to 21) not merely distorts the plain language of the specification but is denounced by this Court's cases. It is what this Court warned against in *White v. Dunbar* (1886), 119 U. S. 47, saying (p. 51):

> "Some persons seem to suppose that a claim in a patent is like a nose of wax which may be turned and twisted in any direction, by merely referring to the specification, so as to make it include something more than, or something different from, what its words express."

Similarly, in *Railroad Company v. Mellon* (1881), 104 U. S. 112, the Court declared (pp. 118-9):

> "He cannot go beyond what he has claimed and insist that his patent covers something not claimed, merely because it is to be found in the descriptive part of the specification."

And more recently in *Milcor Steel Co. v. George A. Fuller Co.* (1942), 316 U. S. 143, the Court gave assurance that (pp. 145-6):

> "it is these claims, not the specifications, that afford the measure of the grant to the patentee. 'Out of all the possible permutations of elements which can be made from the specifications, he reserves for himself only those contained in the claims.'"

Since "each claim must stand or fall, as *itself* sufficiently defining invention," *Altoona Publix Theatres, Inc. v. American Tri-Ergon Corp.* (1935), 294 U. S. 477, the claim cannot (p. 487) "be aided by reading into it parts * * * of other claims," let alone the specification. To do so, *Marconi Wireless Telegraph Company of America v. United States* (1943), 320 U. S. 1, would be (p. 23) "to read the specifications, which taken in their entirety are merely descriptive or illustrative of his invention * * * as though they were claims whose function is to *exclude* from the patent all that is not specifically claimed."

3. To Read Manganese into Patent, by Any Rule, Gives Linde Prohibited Reissue.

If manganese silicate was the discovery, it not having been claimed, and if not barred by Miller, the remedy lay in application for reissue pursuant to 35 U. S. C. § 64. As the Court pointed out in *Merrill v. Yeomans* (1876), 94 U. S. 568, 573:

> "If the patentee is also entitled to a patent for the product of this distillation [or, as in this case, to a patent on manganese silicate], and has failed, as we think he has, to obtain it, the law affords him a remedy, by a surrender and reissue. When this is done, the world will have fair notice of what he claims, of what his patent covers, and must govern themselves accordingly."

But in this case respondent Linde could not obtain a reissue to make the patent cover manganese silicate. Not only does the prior Miller bar the way, but the principles declared in this Court's cases forbid it. Accordingly, being barred of reissue, what Linde now asks is that upon the doctrine of equivalents there be written into the patent what the Patent Office could not grant, or which, if it did, the courts would be bound to hold invalid. *U. S. Industrial Chemicals, Inc. v. Carbide & Carbon Chemicals Corp.* (1942), 315 U. S. 668, 676, 678; *Sontag Chain Stores Co., Ltd. v. National Nut Company of California* (1940), 310 U. S. 281, 293; *Mahn v. Harwood* (1884), 112 U. S. 354; *Milcor Steel Co. v. George A. Fuller Co.* (1942), 316 U. S. 143.

Here, as in *Miller v. Brass Company* (1881), 104 U. S. 350, 351:

> "The only mistake suggested is, that the claim was not as broad as it might have been."

But, as the Court there said (p. 351):

> "This mistake, if it was a mistake, was apparent upon the first inspection of the patent, and if any correction was desired, it should have been applied for immediately."

The Court added (p. 352):

"it must be remembered that the claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, *are, in law, a dedication to the public of that which is not claimed.*"

The Court applied the same rule in *Keystone Bridge Company v. Phoenix Iron Company* (1877), 95 U. S. 274. The patent covered, for [redacted] the lower chords of iron truss bridges, wide and thin steel bars widened at the end by compression to give them additional strength. The accused product consisted of cylindrical bars flattened at the ends. The Court held there was no infringement, because (p. 278):

"When a claim is so explicit, the courts cannot alter or enlarge it. If the patentees have not claimed the whole of their invention, and the omission has been the result of inadvertence, they should have sought to correct the error by a surrender of their patent and an application for a reissue. They cannot expect the courts to wade through the history of the art, and spell out what they might have claimed, but have not claimed."

As the Court pointed out (pp. 278-9):

"This duty is now cast upon the Patent Office. * * * But the courts have no right to enlarge a patent beyond the scope of its claim as allowed * * *."

What this Court says may not be done, the trial court has done. It has assumed the functions of the Patent Office, and has in effect reissued the patent after a lapse of 11 years and upon no showing of "inadvertence, accident, or mistake." 35 U. S. C. § 64. Surely that which could not lawfully be given to Linde as a reissue, cannot be given to it in the name of equivalents. It follows that the judgment of infringement should be reversed.

II. DOCTRINE OF EQUIVALENTS APPLIED TO EXPAND CLAIMS HAS NO PLACE IN PATENT LAW, HAS BEEN UNDERMINED BY THIS COURT'S CASES, AND SHOULD BE EXPRESSLY REPUDIATED.

The doctrine of equivalents, used as a device to expand a patent claim, should be repudiated. It has in fact been undermined by this Court's cases.

1. Rule Conflicts with Principle That Claim is Measure of Grant.

The first rule of the patent law, as the authorities already considered demonstrate, is that the monopoly granted by a patent is confined by the claims.

All else is excluded.

The statute so requires. To obtain his patent the patentee must:

"particularly point out and distinctly claim"

his invention. 35 U. S. C. §33. Accordingly, the claim is the measure of the grant.

But it is the office of the doctrine of equivalents to expand a patent to cover something not covered by the claims as written. Otherwise the patentee has no need for the doctrine.

The rule of the statute and the rule of equivalents are in manifest and irreconcilable conflict.

The rule of the statute restricts the monopoly to that which the patentee has particularly pointed out and distinctly claimed; the doctrine of equivalents expands the monopoly to include what the patentee, had he not elected otherwise, might have added. The doctrine, as Judge Learned Hand has pointed out, is an anomaly. *Claude Neon Lights, Inc. v. E. Machlett & Son* (2 C. C. A., 1929), 36 F. (2d) 574, certiorari denied 278 U. S. 634, 281 U. S. 741. It operates (p. 576) "*in misericordiam* to relieve those

who *have failed* to express their complete meaning." But, as Judge Hand has said (p. 575):

> "It is plain that such latitude violates in theory the underlying and necessary principle that the disclosure is open to the public save as the claim forbids, and that it is the claim and that alone which measures the monopoly."

2. Genesis of Doctrine—It Rests On View Subsequent Cases Reject.

The doctrine of equivalents came into the law over the vigorous dissent of four justices, including Chief Justice Taney, in *Winans v. Denmead* (1853), 15 How. 330. There, as Judge Hand has remarked, 36 F. (2d) 574, 575, the Court "for the first time" held "the claim was not intended to be verbally definitive."

The doctrine, as a device for enlarging a claim, had in this Court a brief life span. It endured for 39 years. It came into the law in 1853. Subsequent cases show it to be a sport. It has not been applied in this Court to the purpose of enlarging a claim for more than a half century. The last time the Court so used it was in 1892. Since then, although never expressly overruled, the doctrine, whatever its original basis, has been destroyed by this Court's cases. In effect the dissent of *Winans v. Denmead* has become law today. The dissent, which subsequent cases have vindicated, declared (p. 347):

> "Nothing, in the administration of this law, will be more mischievous, more productive of oppressive and costly litigation, of exorbitant and unjust pretensions and vexatious demands, more injurious to labor, than a relaxation of these wise and salutary requisitions of the act of Congress. [And, as will be seen, the statute there before the Court, the Act of 1836, was not as specific with reference to the requirement of a claim as the subsequent Act of 1870, which now is 35 U. S. C. § 33.] In my judgment, the principles of legal interpretation, as well as the public interest, require, that

this language of this statute shall have its full significance and import."

This Court's subsequent cases agree. It is appropriate, therefore, to reexamine the doctrine.

—(a) Initially Purpose of Rule Was to Deny Patent for Equivalent of Known Device.

Prior to *Winans v. Denmead* (1853), 15 How. 330, the doctrine of equivalents was known. But it then was used to deny a patent for a device which was merely the equivalent of something previously known and which, therefore, did not qualify as invention.[33] This is the same principle applied in more recent years in cases such as *Cuno Engineering Corp. v. Automatic Devices Corp.* (1941), 314 U. S. 84, *General Electric Co. v. Jewel Incandescent Lamp Co.* (1945), 326 U. S. 242, and *Mandel Brothers, Inc. v. Wallace* (1948), 335 U. S. 291, holding patents, for a new use of something previously known, invalid for want of invention.

—(b) Put to New Use by Five-to-Four Decision of Winans v. Denmead.

In *Winans v. Denmead* (1853), 15 How. 330, the doctrine of equivalents was put to a new and different use. It was applied to find infringement in the use of a device the Court concluded was the equivalent of the patented device. Because *Winans v. Denmead* marks the genesis of the doctrine, used as a tool to enlarge the coverage of a patent, it will be well to note the problem the Court there had before it and to mark the reasons which led the Court to the conclusion announced.

The sole question before the Court was infringement. The invention was for an improvement in railroad cars

[33] See, for example, *Hotchkiss v. Greenwood* (1850), 11 How. 248, where the Court held the patent invalid because (p. 265) "the only thing new *is the substitution* of a knob of a different material from that heretofore used in connection with this arrangement."

for carrying coal and like materials. The patent called for a car, the upper part (p. 339):

> "cylindrical, and the lower part in the form of a frustum of a cone * * *."

The point of the invention was that (p. 339) "by reason of the circular form of the car body, the pressure of the load outwards was equal in every direction, and thus the load supported itself in a great degree" and "being conical, the lower part of the car could be carried down below the truck, between the wheels, thus lowering the centre of gravity of the load * * *."

The trial judge held this was not infringed by defendant's car which utilized an octagonal body and a pyramidal bottom because, where the patentee used a circular form, the defendant used a rectilinear figure.

This Court reversed. The majority, by five-to-four vote, took the view that the patent covered (p. 342):

> "not only the precise forms he has described, but all other forms which embody his invention; it being a familiar rule that, to copy the principle or mode of operation described, is an infringement, although such copy should be totally unlike the original in form or proportions."

Four justices dissented, including Chief Justice Taney. Mr. Justice Campbell, writing the dissent, noted (p. 346):

> "The object of this suit is to repair that [the patentee's] defect of observation. It is, that this court shall extend, by construction, the scope and operation of his patent, to embrace every form which in practice will yield a result substantially equal or approximate to his own."

To this the dissent objected, pointing out (p. 346):

> "The defendant adheres to the rectilineal form. The result accomplished by the use of the two cars is the same—a more economical transportation of coal. This result it is that the plaintiff desires to appropriate, but this cannot be permitted."

The basis of the dissent was this (p. 347):

> "The plaintiff confines his claim to the use of the conical form, and excludes from his specification any allusion to any other. *He must have done so advisedly.* He might have been unwilling to expose the validity of his patent, by the assertion of a right to any other [just as the patentees here may have been unwilling to claim manganese silicate because of the prior Miller]. Can he abandon the ground of his patent, and ask now, for the exclusive use of all cars which, by experiment, shall be found to yield the advantages which he anticipated for conical cars only?
>
> The claim of to-day is, that an octagonal car is an infringement of this patent. Will this be the limit to that claim? Who can tell the bounds within which the mechanical industry of the country may freely exert itself? What restraints does this patent impose in this branch of mechanic art?"

However, in reading *Winans v. Denmead* it is important to bear in mind that the claim then did not occupy so important a place in the patent law as it does today.

—Function of Claims Then Unsettled.

The fact that the majority in *Winans v. Denmead* gave less emphasis than appears in later decisions to the function of the claim as limiting the reach of the patent, is not surprising. The function of the claim was in debate. The Court was divided over the question whether the claim alone measures the grant, or whether the specifications also could be read as claims. Thus in *Brooks v. Fiske* (1853), 15 How. 212, a contemporary of *Winans v. Denmead*, three justices argued in dissent that (p. 223):

> "The written specifications, including the drawings, constitute a part of the patent, and must be construed *as the claim* of the plaintiff."

The majority, however, held (p. 215):

> "we are to look at the others [i.e., the specifications and drawings] only for the purpose of enabling us correctly to interpret the claim."

This is the view which ultimately prevailed. It is the claim that measures the grant, as this Court's cases, including *Graver Tank & Mfg. Co., Inc. v. Linde Air Products Co.* (1949), 336 U. S. 271, 277, make clear.

—Statute Subsequently Changed.

The division then existing concerning the scope of a patent, as reflected in *Winans v. Denmead*, the starting point of the doctrine of equivalents, will be understandable when it is recalled that at that date the statute was much less specific concerning claims. Whereas the law today, 35 U. S. C. § 33, requires the patentee to:

"particularly point out *and distinctly claim*"

his invention, the statute then in force, 5 Stat. 117, 119, § 6, Patent Act of 1836, required that the patentee:

"particularly *specify and point out* the part, improvement, or combination, which he claims as his own invention or discovery."

While the statute used the term "claim" the obligation was to "specify and point out" rather than, as it is today, to "particularly specify *and distinctly claim*." The statute was broader than it is today. It permitted, as the present statute does not, the invention to be gathered from the whole of the patent papers.[34] There was dissatisfaction. The Commissioner of Patents, for example, in 1869 reported to the Congress:

"The great source of litigation is the conflict upon the issue of infringement, or the effort on the part of the inventor to carry the patent beyond the limits assigned to it by the Office at the time of its issue" (Ex. Doc. No. 102, H. R., 41st Congress, 2d Sess., p. 8).

The same Congress to which the Commissioner so complained enacted the Patent Act of 1870. It changed

[34] See "*Definiteness and Particularity in Patent Claims*," 46 MICHIGAN LAW REVIEW, 755 (1948) by William Redin Woodward.

the language of the 1836 Act, which required the patentee to:

"particularly specify and point out"

his invention. In lieu of this language the 41st Congress, in the Patent Act of 1870, 16 Stat. 198, 201, § 26, required the patentee to:

"particularly point out **and distinctly claim**"

his invention.[35] This is the language which continues in effect today in 35 U. S. C. § 33.

This significant change in the language of the statute since *Winans v. Denmead* is itself adequate to call for re-examination of the basis of the doctrine of equivalents.

—(c) Subsequent Course of Decision—Rule Has Been Rarely Used to Expand Claims.

Although following upon *Winans v. Denmead* there has been recurrent discussion of the doctrine of equivalents in the cases, it should be noted that, despite breadth of statement, in only eight cases since *Winans v. Denmead*—confined to a span of 39 years, ending in 1892—has this Court used the doctrine as a tool for expanding the language of a claim.[36] But even in those cases, the dose was homeo-

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[35] The amended statute, enacted in 1870, says at the critical point:

"*and he shall particularly point out* **and distinctly claim** the part, improvement, or combination which he claims as his invention or discovery" (16 Stat. 198, 201, § 26).

[36] The cases in which, subsequent to *Winans v. Denmead*, this Court utilized the doctrine to give the patentee what he did not "distinctly" claim are: *Seymour v. Osborne* (1870), 11 Wall. 516; *Ives v. Hamilton* (1875), 92 U. S. 426; *Blake v. Robertson* (1876), 94 U. S. 728; *Machine Company v. Murphy* (1877), 97 U. S. 120; *Imhaeuser v. Buerk* (1879), 101 U. S. 647; *Clough v. Barker* (1882), 106 U. S. 166; *Roger v. Schultz Belting Co.* (1890), 135 U. S. 319; *Hoyt v. Horne* (1892), 145 U. S. 302. In these the expansion was mild, at best, and then only where it clearly appeared that the invention, although not neatly expressed in the claims, could be gathered from the whole of the patent.

pathic compared with what is asked here. Moreover, in all of these cases, except the last, *Hoyt v. Horne* (1892), 145 U. S. 302, the patent issued prior to the change in the language of the statute to require the patentee to "*distinctly claim*" his invention.

Not since *Hoyt v. Horne* in 1892—for more than half a century—has this Court applied the doctrine to expand a claim. The course of decision, as has been seen (pp. 39 to 44, *supra*) has been the other way around.

However, because of recurrent reference to the doctrine of equivalents in the cases, it will be well to note the uses to which the Court in fact has put the doctrine. It is important to distinguish between what has been said and what has been done.

—Not Utilized to Declare Infringement.

In the great bulk of the cases which deal with equivalents, the Court in fact has held either that the patent was invalid, or, if valid, that it was not infringed. Such cases, therefore, are not authority for the doctrine that something can be *read into* a claim in the name of equivalents which is not embraced in the claims as written.[37]

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[37] Among such cases, holding the patent invalid, or, if valid, not infringed, are decisions pointing out that:

A narrow range of equivalents only is available to a patent which is not a pioneer. Typical is *Cimiotti Unhairing Company v. American Fur Refining Company* (1905), 198 U. S. 399, where the Court suggested that (p. 406) "a greater degree of liberality and a wider range of equivalents are permitted where the patent is of a pioneer character" (as the present patent is not, in view of the finding that Jones produced merely an improved flux for use in an old process. Finding 7, R. 924; Finding 27, R. 927). The Court, however, held there was no infringement and observed (p. 410) "In making his claim the inventor is at liberty to choose his own form of expression, and **while the courts may construe the same in view of the specifications and the state of the art, they may not add to or detract from the claim.**" To the same effect are: *Knapp v. Morss* (1893), 150 U. S. 221,

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—Broad Implications Not Justified.

In what has come to be regarded as the leading case on the doctrine of equivalents, *Continental Paper Bag Company v. Eastern Paper Bag Company* (1908), 210 U. S. 405, the Court, it should be noted, did *not* use the doctrine to expand the claims. The Court merely held that the claims, which were broad enough to cover the accused device, were *not limited by the description* in the specification, which, as the Court pointed out, merely sets forth what the

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230; *Kokomo Fence Machine Company v. Kitselman* (1903), 189 U. S. 8, 19; *Westinghouse v. Boyden Power Brake Company* (1898), 170 U. S. 537, 561-2; *Singer Manufacturing Company v. Cramer* (1904), 192 U. S. 265; *Computing Scale Company of America v. Automatic Scale Company* (1907), 204 U. S. 609, 621; *Boyd v. Janesville Hay Tool Company* (1895), 158 U. S. 260, 261, 267; *Wright v. Yuengling* (1894), 155 U. S. 47, 52; *Miller v. Eagle Manufacturing Company* (1894), 151 U. S. 186, 207; *Goodyear Dental Vulcanite Company v. Davis* (1880), 102 U. S. 222; *Brill v. Washington Railway and Electric Company* (1910), 215 U. S. 527, 533. In none of these cases did the Court apply the doctrine of equivalents to expand the claims of the patent. It held the patent invalid or not infringed.

Only materials then well known to be equivalents are within the rule. *Gill v. Wells* (1874), 22 Wall. 1, illustrates the point. The Court held the patent invalid but pointed out (p. 28) "*By an equivalent* in such a case it *is meant that the ingredient substituted* for the one withdrawn performs the same function as the other, and that it *was well known at the date of the patent* securing the invention *as a proper substitute* for the one omitted in the patented combination." See also *Gould v. Rees* (1872), 15 Wall. 187, 193; *Halliburton Oil Well Cementing Co. v. Walker* (1946), 329 U. S. 1, 10, 13.

Unless both perform the same function the one is not the equivalent of the other. *Powell v. Lindsay* (1885), 113 U. S. 97, 103; *Gill v. Wells* (1874), 22 Wall. 1, 28-9. Here, it will be recalled, as the trial judge found, the accused flux does something the Jones flux does not: It introduces manganese into the weld metal (R. 919), a desirable result (R. 283). See Note 27, pp. 31 to 32, *supra*.

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inventor considered the best mode of practicing the invention.

The argument in the *Continental Paper Bag* case was that, since the invention was not a pioneer—or so the accused argued—the coverage of the patent (p. 415) "should be limited to the details *described in its specifications* * * *." This contention the Court rejected. Thus, the Court's comment that (p. 415) "the range of equivalents depends upon and varies with the degree of invention" had reference, not to the question whether the claims of the patent could be *enlarged* by resort to the doctrine of equivalents, but only to the question whether they should be *narrowed* to the specific device described in the specification.

The case, therefore, is not authority for the proposition that the claims of a patent may be enlarged in the name of the doctrine of equivalents. Indeed, the Court expressly cautioned (p. 419):

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Similarity of result does not mean the two are equivalents. Thus, in *Burr v. Duryee* (1863), 1 Wall. 531, in holding a machine for forming hat bodies not infringed, the Court noted (p. 573) "The argument used to show infringement assumes that every combination of devices in a machine which is used to produce the same effect, is necessarily an equivalent for any other combination used for the same purpose. This is a flagrant abuse of the term 'equivalent.'"

Recapture of elements abandoned to obtain the patent cannot be effected in the name of equivalents. As the Court, in *Exhibit Supply Co. v. Ace Patents Corporation* (1942), 315 U. S. 126, in holding the patent invalid, noted (p. 137) "what the patentee, by a strict construction of the claim, has disclaimed * * * cannot now be regained by recourse to the doctrine of equivalents, which *at most* operates, by liberal construction, to secure to the inventor the full benefits, not disclaimed, *of the claims* allowed." To the same effect are: *Smith v. Magic City Kennel Club, Incorporated* (1931), 282 U. S. 784, 790; *Keystone Driller Co. v. Northwest Engineering Corp.* (1935), 294 U. S. 42, 48; *Schriber-Schroth Co. v. Cleveland Trust Co.* (1940), 311 U. S. 211, 221-2. In none of these cases was infringement found.

"The invention, of course, must be described and the mode of putting it to practical use, but the claims measure the invention. They may be explained and illustrated by the description. They **cannot** be enlarged by it."

Such is the use to which the doctrine of equivalents—with the exceptions noted in the 39 year period from 1853 to 1892—has in fact been put. It has been applied only to hold that, where the invention is meritorious, it is not to be limited to the specific device described in the specifications, but is entitled, *if the claims be broad enough*, to equivalents of the device so described in the specifications. But the doctrine has not been applied to *expand* claims to make room for something more in the name of equivalents.[38]

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[38] That the Court, despite the broad reach of language sometimes used, has not used the doctrine of equivalents to write into claims something not already there is plain from the cases where infringement has been found in the name of equivalents. These cases are:

Hildreth v. Mastoras (1921), 257 U. S. 27, where the Court held a patent on a candy making machine infringed because, being (p. 36) "a generic patent, the doctrine of broad equivalents properly applies here." However, the Court did not use the doctrine to expand the claim. Indeed, as the Court noted (p. 35) "Taking the first claim of Dickinson's patent *as it reads*, one can trace every element of it in the Langer [the accused] machine." The quarrel was not over the question whether the claim, "as it reads," could be enlarged, but only whether it should be *limited* to the specific device described in the specifications.

United States v. Societe Anonyme des Anciens Etablissements Cail (1912), 224 U. S. 309, where the Court held the government had infringed a patent on a breech loading cannon, invented, appropriately enough, by a man named De Bange. But here again, the claim as written was broad enough to cover the accused device. The government's argument to escape infringement was, not that the claim did not cover, but that (p. 324) "the claim must be confined to the specific forms" shown in the specification. Thus (p. 326) "The Government now contends for

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Plainly, the doctrine of equivalents, despite language employed in some of the cases, has not been put to expansionist uses.

The doctrine has a purpose, but it is *not* to expand a claim.

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a limitation of it, and insists that it consists of 'a yielding packing M,' exactly as described [in the specifications], although the description is declared by De Bange to represent 'the best means of carrying out his invention' * * *." The Court rejected the government's argument, but pointed out that (p. 326) "in rejecting it *we do not* render 'the claim elastic and indefinite where it should be certain.'" The Court did not read into the claim something not there; it refused merely (p. 328) "to read into the claim" a limitation not expressed in the claim as written.

Morley Sewing Machine Company v. Lancaster (1889), 129 U. S. 263, where the Court held a sewing machine patent infringed by an "equivalent." However, the question was not whether the claims could be expanded by the doctrine of equivalents, but whether the claims as written should be narrowed to embrace only the specific device described in the specifications. Thus (p. 284) "The view taken on the part of the defendant * * * is that * * * those claims are to be limited to the special devices described in the patent * * *." The Court refused to so narrow the claims, pointing out that (p. 284) "in a pioneer patent, such as that of Morley, with the four claims in question such as they are, the special devices set forth by Morley are not necessary constituents *of the claims*." The Court added (p. 286) "his patent, especially in view of the character *and terms of the four claims* in question, is not to be limited to the particular devices" shown in the specifications.

Sanitary Refrigerator Company v. Winters, (1929), 280 U. S. 30, where the Court held a patent on a refrigerator door latch infringed. Although the patent (p. 40) "was not a pioneer patent entitled to a broad range of equivalents" the Court noted (p. 42) "'Authorities concur that the substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself * * *.'" However, the Court was not talking about expanding the claims; what it was concerned with was the question whether, in view of the crowded state of the art, the

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—Its Proper Role Is a Limiting One.

The proper role of the doctrine of equivalents is a limiting one to prevent the spread of a patent monopoly to embrace the "equivalent" of something already old in the art. This is illustrated by cases such as:

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claims should be limited to the particular device described in the specifications. The question there was whether (p. 33) "these *claims* should be so read as to restrict their right to the specific construction * * *." The Court agreed (p. 41) "the claims of the Winters and Crampton patent are limited to the structure therein disclosed [that is, disclosed in the specifications]", but held that so restricted they were infringed because (p. 41) "the Winters and Crampton patent, although thus limited had some range of equivalents; and we think that, though it be a narrow one, it is sufficient." The reason was (p. 42) "even where, in view of the state of the art, the invention must be restricted to the form shown and described by the patentee [i.e., in the specifications] * * * it is nevertheless infringed by a device in which there is no substantial departure *from the description* in the patent, but a mere colorable departure therefrom."

Cochrane v. Deener (1876), 94 U. S. 780, where the Court held a patent on a process of manufacturing flour infringed. The Court considered the two (p. 789) "equivalents of each other." However, the Court did not utilize the doctrine to expand the claim. To the contrary, the Court pointed out that (p. 788) "defendants clearly infringe, at least, the last claim" because, as the Court remarked (pp. 789-90) "The *claim* of the patent *is not confined* to any particular form of apparatus, but (in regard to the valves, for example) embraces generally any valves for feeding and delivering the meal without allowing the air to pass through. We are of opinion, therefore, that the combination *here claimed* is infringed by the apparatus used by the defendants." Thus, although the Court found infringement, and utilized the doctrine of equivalents, it did not use the doctrine to expand the claim which was itself broad enough to cover the accused process.

Sessions v. Romadka (1892), 145 U. S. 29 where the Court held a patent on trunk fasteners infringed. However, all the Court held was that (p. 45) "In view of the fact that Taylor was a pioneer * * * he is entitled to a liberal construction *of his claim* * * *." There he

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Dow Chemical Co. v. Halliburton Oil Well Cementing Co. (1945), 324 U. S. 320, where the Court held the patent invalid because (p. 330) "It is elemental that the mere substitution of equivalents which do substantially the same thing in the same way, even though better results may be produced, is not such an invention as will sustain a patent."

American Fruit Growers, Incorporated v. Brogdex Co. (1931), 283 U. S. 1, where the Court held invalid, because anticipated, a patent for a method of pre-

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cause the accused device contained (p. 45) "all the elements of his combination" the Court found infringement despite "superficial dissimilarities in their construction."

Hobbs v. Beach (1901), 180 U. S. 383, where the Court held a patent on a paper box making machine infringed. However, there, because the claims used the words, "substantially as described," the argument was (p. 399) "unless the infringing device contains mechanism substantially such as is described in the patentee's *specification, and shown in his drawings*, there can be no infringement." The Court refused to so limit the claims which, as drawn, were broad enough to cover the accused device. The Court (p. 400) "Without determining what particular meaning, if any, should be given to these words," held (p. 399) "they do not limit the patentee to the exact mechanism described *in his specification* • • •."

Abercrombie & Fitch Company v. Baldwin (1917), 245 U. S. 198, where the Court held infringed a patent for a lamp designed to generate and burn acetylene. Although the Court thought the invention (p. 207) "entitled to invoke the doctrine of equivalents," the Court did not use it to expand the claims as written. The debate raged, not on the question whether the claims could be expanded, but only on the point (p. 205) "that the patent *is confined* to a special form and, so confined, is not infringed; and that the extension of the patent by the reissue is void."

Manifestly, the use to which the doctrine has been put, where infringement has been found, has not been to expand claims as written. All that the Court has held is that *where the claims themselves are broad enough*, the patentee may, upon the doctrine of equivalents, escape limitation of those claims to the *specific* device described in the specifications.

paring fruit for market to prevent mold. The Court said (p. 14) "That boracic (boric) acid—a weak acid—and borax, with an alkaline reaction, inhibit the rapid development of blue mold has long been known. Both are compounds of boron and contain the 'boric acid radical.' Their antiseptic quality is due to the presence of that element. For present purposes, the two must be regarded as equivalents, and the mere substitution of one for the other would not involve invention or avoid infringement."

While the Court brought infringement into the sweep of its statement, the only purpose for which the Court resorted to the doctrine was to point out why the patent lacked invention. The case illustrates why it is important in measuring the range of the doctrine of equivalents to note the purpose to which it in fact has been applied.[39]

As the cases show, the Court has talked about the doctrine, but has never (since 1892) applied it to *enlarge* the coverage of a claim.

3. Doctrine as Tool for Expanding Patent Claims Should be Expressly Overruled.

The doctrine of *Winans v. Denmead* (1853), 15 How. 330, that a claim may be expanded beyond the plain import of its terms, from which springs the doctrine of equivalents Linde here seeks to apply, would in effect, as the dissent in that case warned (p. 346):

> "extend, by construction, the scope and operation of his patent, to embrace every form which in practice will yield a result substantially equal or approximate to his own."

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[39] Other cases, similarly applying the doctrine of equivalents as a basis for *invalidating*, not expanding, a patent, are *Crouch v. Roome* (1880), 103 U. S. 797, and *Florsheim v. Schilling* (1890), 137 U. S. 64, 76.

The consequence foreseen by the dissent has since been avoided because the Court has in fact rigidly refused to expand patents beyond the plain language of the claims. The rule of *Winans v. Denmead* has in effect been repudiated by this Court's subsequent cases declaring the claim to be the measure of the grant. (See pp. 39 to 44, *supra*.)

There is, moreover, no reason for applying to a patent any different rule than applies to any other written instrument. A patent claim like a deed, to which it has frequently been likened, can encompass no more than is embraced within its metes and bounds. If it does not cover all that was intended, the remedy is by suit for reformation. So with a patent, if the claims be not broad enough to cover the full invention, the patentee has his remedy. If the failure be by reason of objections of the Patent Office, the patentee has his remedy by appeal, *Keystone Bridge Company v. Phoenix Iron Company* (1877), 95 U. S. 274, 278; if by accident or mistake, the patentee has his remedy by reissue. *Merrill v. Yeomans* (1876), 94 U. S. 568, 573. One who follows neither course has dedicated the balance to the public. *McClain v. Ortmayer* (1891), 141 U. S. 419, 423-4; *Milcor Steel Co. v. George A. Fuller Co.* (1942), 316 U. S. 143, 145-6. Otherwise the claims of the patent no longer will serve to warn the public of the area closed to it. *General Electric Co. v. Wabash Appliance Corp.* (1938), 304 U. S. 364, 369; *Universal Oil Products Co. v. Globe Oil & Refining Co.* (1944), 322 U. S. 471, 484-5. The result would be to lay upon business "fears and apprehensions of concealed liens and unknown liabilities," *Atlantic Works v. Brady* (1882), 107 U. S. 192, 200, *Halliburton Oil Well Cementing Co. v. Walker* (1946), 329 U. S. 1, 12, and effectively subject to the monopoly of a patent that which has not been granted.

The Court should, therefore, as it already has done in fact, expressly repudiate the doctrine of *Winans v. Denmead* to the extent it purports to sanction any doctrine of equivalents which operates to expand the plain terms of a patent grant.

III. IF RULE OF EQUIVALENTS STILL HAS VITALITY THE DOCTRINE, NO MATTER HOW BROAD, CANNOT ENLARGE CLAIMS TO COVER MANGANESE SILICATE—TO DO SO WOULD BE TO RECALL FROM PUBLIC DOMAIN PRIOR PATENTED AND UNPATENTED FLUXES.

The doctrine of equivalents, assuming it still to be a vital doctrine, no matter how broad, cannot be carried to the length of writing into the claims of Jones the manganese silicate Lincoln used which the claims as written exclude.

To do so would expand the patent into invalidity. It would enlarge Linde's monopoly to cover fluxes long in the public domain. It would bestow, in the name of equivalents, what the patentees not only pointedly refrained from claiming but which, if claimed, the Patent Office would have been compelled to deny. This would reduce to empty form the patentee's obligation to "particularly point out *and* **distinctly claim**" his invention.

1. Trial Court Found Equivalency But Only by Mistake of Law.

The trial court, it will be remembered, found Lincoln's manganese an equivalent because the patentees in the specification said "We have used" manganese along with the other eight silicates named, from which the trial court concluded:

> "Thus, the fact that manganese is a proper substitute for calcium silicate as a major ingredient of the welding composition invented by Jones, Kennedy and Rotermund is fully disclosed *in the specification* of their patent" (R. 920).

Accordingly, the trial court, although it found (Finding 12, R. 925) Lincoln's manganese silicate is not an alkaline earth metal silicate to which claims 18, 20, 22, 23, now before the Court, are unambiguously confined, nevertheless held:

"The patent discloses [and whether it does is obviously a pure question of law] that manganese silicate * * * is a proper substitute for the silicates of the alkaline earth metals" (Finding 14, R. 925)

and that

"The accused Lincolnweld flux and the composition of the patent in suit are substantially identical *in operation* and *in result*" (Finding 20, R. 926), or as Finding 21 (R. 926) puts it: "*in welding operation* is in all respects equivalent to the compositions of the patent in suit."[40]

However, in dealing with these findings it is important to note that they begin in a misreading of the specification relied upon to find the equivalency which makes Lincoln an infringer.

—(a) Court Misread Language of Specification it Relied Upon.

The specification—on which the trial court's finding of equivalency turns—says:

> "We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions. * * * While a number of these * * * are more or less efficacious * * * we prefer to use silicates of the alkaline earth metals, such as calcium silicate * * *" (Patent, R. 956, col. 1, lines 62-72).

The trial court mistook this to mean that the patentees there were advising the world that they had used each of the nine silicates mentioned separately and that the patentees had found each would accomplish the objectives of the patent, some more effectively than others (R. 917, 920).

But that is not what the specification says.

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[40] The finding is not, as this Court on the prior review supposed, that the two fluxes are "substantially identical." 336 U. S. 271, 276. The finding is that they are substantially identical "in operation and in result." See discussion pp. 31 to 33, *supra*.

—Patent Does Not Say Each of Nine Used.

To begin with, note that as a matter of reading English—disregarding for the moment what the scientific facts may or may not be—what the specification says is that the patentees:

"have used *calcium silicate and*"

the other eight silicates named, including manganese silicate, "in binary and ternary combinations," that is, in combinations of two or three, consisting of calcium silicate *and* one or two of the other silicates named. Read as English that is what the sentence, so far, says.

Moreover, this is precisely what the patentees *intended* to say as demonstrated by the fact that the record of their experiments shows this to be exactly what the patentees did use. Of the 63 fluxes containing silicates, 57 contained calcium silicate either alone or in binary and ternary combinations with the other silicates. See pp. 18 to 21, *supra*, where the point is documented.

—Patent Does Not Say Each Operable.

Next—second point—note that the patentees do not say they found *each* of the nine silicates efficacious. They say:

"*a number of* these * * * are more or less efficacious * * *."

The trial court supposed that by this specification the patentees were advising the world they had found *each* of the nine efficacious and were pointing out merely that some of the nine were more efficacious than others of the nine (R. 917, 920).

That is not what the specification says.

Read, again as an English sentence, the specification says:

"a number of"

these—that is, "a number of" *but not all* of the nine—are more or less efficacious. The patentees do not say "each,"

or "all," of the nine, but only an unspecified "number of" the nine are more or less efficacious. There was no occasion for the patentees to be more specific in disclosing *which* of the nine they had found more or less efficacious. All they were doing was summarizing their experiments.

Moreover, that the patentees intended to say, not that *all* of the nine, but only that "*a number* of" them, that is, some number less than nine, are more or less efficacious, is demonstrated by their experiments. See pp. 18 to 21, *supra*. They found that some of the nine were not efficacious at all, but that, of those of the nine which were efficacious, some were more efficacious than others.[1]

Thus, the trial court's finding of equivalency begins in a misreading of the specification.

2—(b) Court Applied Erroneous Rule to Miller; Linde thus Given Flux it Could Not Claim.

Aside from the misreading, the greater evil in the trial court's holding of equivalency is that it (1) expands the claims by resort to the specification and in doing so (2) writes into the patent as an equivalent what the patentees could not claim.

—Miller Misread, Then Written into Jones.

First. Had the patentees *claimed* manganese silicate, the claim would have been barred by the prior Miller. The trial court, to be sure, thought not. But, as has been seen (pp. 34 to 36, *supra*), the trial court's rejection of Miller as anticipatory art rests upon the application to Miller of an untenable rule of construction. It is the same rule this Court denounced in *Alexander Milburn Company v. Davis-Bournonville Company* (1926), 270 U. S. 390. In that case the trial court did what the trial court did here. There (p. 399):

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[1] Let it be accepted for the moment that some were not efficacious at all; the proof will come later. See pp. 67 to 71.

"The District Court gave the plaintiff a decree [just as the trial court did here], holding that, while Clifford [the prior inventor in that case, corresponding to Miller here] might have added this claim to his application, *yet as he did not*, he was not a prior inventor."

So here, because Miller disclosed that "[instead of preformed [that is: prefused] manganese silicate," ingredients could be fused *in situ* to produce the same result (i.e., welding under "a blanket of molten manganese silicate," thus permitting "one operation to be dispensed with"), the trial court treated Miller's disclosure as if it were limited to his preferred form.[18] By thus limiting Miller, read as anticipatory art, to his expressed preference, the trial court concluded Miller did not anticipate the claims of Jones if expanded to include manganese silicate as an equivalent. This is precisely the reading which brought reversal in *Davis-Bournonville*. It likewise requires reversal here. Both rest on the same error of law. Notwithstanding Miller *preferred* another form, Miller having disclosed the use of prefused manganese silicate, Jones could not claim it. Jones was not the first inventor. *Minerals Separation North American Corporation v. Magma Copper Company* (1930), 280 U. S. 400, 402.

Second. If the doctrine of equivalents is to apply at all, it would seem to be plain that Jones, if manganese silicate be read into that patent, is the mere equivalent of Miller. Thus, the only application the rule of equivalents can have here is to destroy Jones. Miller, having *disclosed* the use of manganese silicate as a welding flux, "is entitled to the benefit of all the uses to which it can be put, no matter whether he had conceived the idea of the use or not." *Roberts v. Ryer* (1875), 91 U. S. 150, 157. That is the rule this Court uniformly has applied in holding in-

[18] If Miller is thus to be limited to his preferred form, all the more reason why Jones likewise must be limited to his preferred form. The Jones patent says "we *prefer* to use silicates of the alkaline earth metals" (R. 956, col. 1, lines 71-2).

valid patents which seek to monopolize the disclosure of an earlier invention.[13]

Thus, by reading Miller's disclosure into these claims, Jones is necessarily destroyed.

Third. Just as a patentee cannot, by failing to be specific, obtain what he could not obtain had he been specific, so here the patentees cannot in the name of equivalents secure, as if claimed, that which they could not, and did not, claim. "Certainly, if we are to be consistent with Rev. Stat. 4888, a patentee cannot obtain greater coverage by failing to describe his invention than by describing it as the statute commands." *Halliburton Oil Well Cementing Co. v. Walker* (1946), 329 U. S. 1, 13.

This is not all.

—Other Fluxes Recalled from Public Domain.

Aside from Miller, other fluxes likewise are recalled from the public domain. They, too, are necessarily "equivalents."

If manganese silicate, because it appears in the list of nine, is an equivalent, so also is each of the other eight in that list. Included in that list is Robinoff's aluminum silicate. The consequence of the doctrine of equivalents the trial court has applied is that these two fluxes, Miller's manganese silicate and Robinoff's unpatented aluminum

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[13] See for example: *Alexandria Brass and Copper Company v. Electrical Supply Company* (1892), 144 U. S. 11, 18; *New York Scaffolding Company v. Chain Belt Company* (1920), 254 U. S. 32, 37; *Corona Cord Tire Company v. Dovan Chemical Corporation* (1928), 276 U. S. 358, 369; *Radio Corporation of America v. Radio Engineering Laboratories, Inc.* (1934), 293 U. S. 1, 14; *General Electric Co. v. Jewel Incandescent Lamp Co.* (1945), 326 U. S. 242, 248-9. The basis of the rule is that "a product must be more than new and useful to be patented; it must also satisfy the requirements of invention or discovery." *Funk Brothers Seed Co. v. Kalo Inoculant Co.* (1948), 333 U. S. 127, 131. "It is immaterial that his structure for using the method was neither the best possible nor as skillfully designed or used as that later employed by Smith." *Smith v. Hall* (1937), 301 U. S. 216, 222.

silicate, which rightfully are public property, are made to pay tribute to Linde.

And, it well may be asked, is each of these nine also to have its own equivalents, which in turn are to be brought within the reach of this patent? Are other patents also henceforth to be read as embracing, not merely that which has been distinctly claimed, but also as equivalents, elements vaguely hinted at in the patent papers?

2. Trial Court's Equivalents Rule Expands Patent into Invalidity.

The effect of the trial court's doctrine of equivalents is to expand the patent into invalidity.

—(a) It Reads into Patent Inoperable, As Well as Operable, Compounds.

Not only does the trial court's rule of equivalents reclaim the past, a practice frowned upon in the patent law,[1] but it writes into the patent also inoperable compounds.

—Trial Court Did Not Find All Nine Operable.

To see why the result of the trial court's rule of equivalents is to write inoperable compounds into the patent along with usable fluxes, it is important to note that it is not true, as this Court upon the prior review supposed, that the trial court found each of the nine silicates named in the specification "had been proved operative." 336 U. S. 271, 276.

The trial court did not so find.

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[1] "But it was not the intention of this law, to take from the public that of which they were fairly in possession." *Shaw v. Cooper* (1833), 7 Pet. 292, 319. See also: *Evans v. Eaton* (1822), 7 Wheat. 356; *Burr v. Duryee* (1863), 1 Wall. 531, 571, 576; *Railway Company v. Sayles* (1878), 97 U. S. 554, 563-4; *Miller v. Eagle Manufacturing Company* (1894), 151 U. S. 186, 198; *Bassick Manufacturing Co. v. R. M. Hollingshead Co.* (1936), 298 U. S. 415, 425; *Lincoln Engineering Co. v. Stewart-Warner Corp.* (1938), 303 U. S. 545, 549.

It could not so find. The evidence, conclusive and undisputed, is to the contrary.

The Court of Appeals, to be sure, supposed the nine "had been proved operative" (R. 1001). But this results from misreading what the trial court said. What the trial court said, and the Court of Appeals misread, was itself a misreading of the language of the patent, but, be that as it may, the point to note is that the trial court's comment about the nine as operable was not made as a finding of fact but only as an interpretation of what the patentees said. It was an interpretation of the language of the patent. This occurs in two places.

The trial court's first reference to the nine is in connection with its construction of the sentence in the specification saying "a number of these [nine] * * * are more or less efficacious." This is the trial court's language:

> "Despite defendants' arguments concerning the proper meaning of the clause * * * *a fair construction* of it is that * * * the inventors found a number of them will accomplish the objectives of the patent more effectively than others of the group" (R. 917).

Note that the court was not concerned with the question whether the nine were in fact operable; the concern was solely with the *meaning* of language; the question was: What were the patentees to be understood as saying?

The second reference occurs in Finding 13 (R. 925). It says:

> "Manganese silicate is one of the nine metallic silicates *which the specification discloses* that the inventors have used as principal constituents in welding compositions attaining more or less effectively the objectives of their invention."

Note that the trial court does not find that the nine are operative; it finds only that manganese silicate is one of the nine "which the specification" *says* are operative. This plainly is not a finding that each of the nine "had been

proved operative." It is merely an interpretation of the language of the specification.

—It Found Only Four Operable.

What the trial court found was that only four of the nine are operable.

The four which are operable are calcium, magnesium, and barium (Finding 10, R. 925) and manganese (Finding 13, R. 925). Finding 10 shows that strontium also is operable but it is not one of the nine. It is one of the alkaline earth metal silicates to which claims 18, 20, 22 and 23, now before the Court, are confined.

—Five Not Found Operable.

The remaining five of the nine metallic silicates were not found to be operable. The finding was that "many silicates, even many metallic silicates, are inoperative" (Finding 17, R. 926). Indeed, the court could not have found the remaining five operable because the undisputed record shows the contrary. As to the remaining five, each of which, under the trial court's construction, is to be read in place of the:

"major proportion of alkaline earth metal silicate"

called for in the claims, the record shows that *if used in "major proportion"*:

> Iron silicate, one of the nine, will not produce a satisfactory weld. The patentees told the Patent Office that "results obtained with iron-bearing silicates have not been satisfactory" (second application, Pltfs. Exh. 126, R. 26, 1074, 1078). Their notes show it to be "Perfectly no good" (Defts. Exh. 88, R. 425, 1153, test 299, R. 1231). The inoperability of iron silicate was confirmed by the unrebutted testimony of petitioners' chemical expert, Dr. Booth (R. 652-3).

Sodium silicate, likewise one of the nine, the patentees' notes show "gives round holes" (Defts. Exh. 88, R. 425, 1153, test 340, R. 1240-1). The inoperability of sodium silicate was likewise confirmed by the unrebutted testimony of Dr. Booth (R. 653-4).

There remain, out of the nine, three silicates. The trial court did not find them to be operable. Of these:

Aluminum silicate, which Robinoff used, proved unsatisfactory (R. 31, 879-81) when not heated but produced good welds when heated (R. 1206, Pltfs. Exh. 88, test 138, R. 1207, flux 21, R. 1155). The patentees told the Patent Office "it is probable that alumina-containing compositions may also be used in certain cases, although we have not tested them extensively" (second application, Pltfs. Exh. 126, R. 26, 1074, 1078).

This leaves two, cobalt and nickel. Whether they are operable, the record, as next will be pointed out, commits to silence.

—(b) It Likewise Includes, as Equivalents, Fluxes Requiring Further Experiment.

As to two of the nine, cobalt and nickel, there is nothing in the record to show whether they, used in the "major proportion" called for by the claims, are or are not operable.[45] As to these further tests would be necessary. Nevertheless they, just as much as manganese, are made equivalents.

Thus, the effect of the trial court's rule of equivalents

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[45] The only reference to the use of nickel or nickel silicate in a flux appears in the patentees' statement to the Patent Office that "Silicon, manganese, nickel and other ingredients may be added to the weld metal deposited by properly adding their compounds to the flux" (Pltfs. Exh. 125, R. 26, 1043, 1050). Plainly these were *not* to be used in "major proportion."

is to write into the patent fluxes which are operable (although not claimed), others which are shown by the patentees' own admissions (without dispute) to be inoperable, and yet others as to the operability of which the record is silent. To give the patent so broad a sweep is to destroy it. *The Incandescent Lamp Patent* (1895), 159 U. S. 465, 472, 476; *Corona-Cord Tire Company v. Dovan Chemical Corporation* (1928), 276 U. S. 358, 385.

The trial court's doctrine of equivalents does worse.

—(c) It Mutilates Express Limitations Patentees Wrote into their Patent.

The rule, as applied, writes into the patent as equivalents for use "in major proportion" in lieu of the alkaline earth metal silicates, two silicates, out of the nine, which can be regarded as equivalents only by doing violence to the express language of the patent.

These two are:

Manganese silicate. This is the silicate Lincoln used. Lincoln used it "in major proportion." The trial court found "the accused flux is composed principally of manganese silicate" (R. 919-20), i.e., 48.19% manganese oxide and 40.30% silica, forming manganese silicate (Finding 21, R. 926). However, the patent in suit tolerates manganese silicate, not "in major proportion," but expressly says it "may be added in **moderate** amounts" (R. 956, col. 2, line 33; see appendix, p. 75). This "moderate" amount the trial court's doctrine of equivalents transforms into "a major proportion."

Aluminum silicate. This is the silicate Robinoff used. Although the trial court's rule of equivalents calls for use of aluminum silicate "in major proportion" in lieu of the alkaline earth metal silicates, the patent in suit expressly says aluminum sili-

cate must *not* be used in "major proportion." The same paragraph of the specification on which the trial court based its doctrine of equivalents calls for "*minor* proportions of alumina" (R. 956, col. 1, lines 73-4) and in claims 10 and 26 through 29 the alumina content is expressly limited to 1% to 8% (R. 959, 960).

Manifestly a doctrine of equivalents which (1) has the effect of sweeping into the patent grant prior patented and unpatented fluxes, (2) calls for the use of silicates the patentees themselves, without dispute in the evidence, have proved to be inoperable, (3) embraces other silicates, the utility of which remains for further experiment, and (4) can be applied only by multilating the express language of the claims and specification, cannot stand.

These results, however, are avoided if the patent, as it should be, is confined to that which the claims now held valid expressly cover, namely "alkaline earth metal silicate" fluxes. Linde then will have protection for the specific discovery which is the patentees' contribution to the art and which Linde has commercially exploited. But Linde is not entitled to have its patent expanded to find infringement in the use of that which admittedly is not within the claims. The Court now, as before, should declare its "disapprobation of these ingenious attempts to expand a simple invention * * * into an all-embracing claim, calculated by its wide generalizations and ambiguous language to discourage further invention in the same department of industry and to cover antecedent inventions." *Carlton v. Bokee* (1873), 17 Wall. 463, 471-2.

CONCLUSION.

On the facts *as found* the Court should hold there is no infringement. The judgment in review accordingly should be reversed. It should be reversed because:

1. The claim measures the grant. Accordingly, neither resort to specifications, nor any doctrine of equivalents, can write into a claim what admittedly is not there. That which is disclosed, but not claimed, is public property.
2. The doctrine of equivalents, used as a tool to expand the claims of a patent, has been undermined by the decisions of the last 50 years and should be expressly repudiated.
3. Even if the doctrine of equivalents be now reinvigorated, it cannot, without destroying the patent structure, be made broad enough to write into the patent as equivalents, compounds which if directly claimed could not be allowed, or which if allowed, would expand the patent into invalidity.

The specific discovery of the patentees is covered and protected by the claims now held valid. Respondent's monopoly should be confined to those claims.

Respectfully submitted,

JOHN F. OBERLIN,
ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
JAMES R. STEWART,
CHARLES L. BYRON,
Counsel for Petitioners.

September 16, 1949.

EXCERPTS FROM SPECIFICATION DESCRIBING WELDING FLUX OF PATENT IN SUIT.

We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, **both in binary and ternary combinations,** in various proportions. We have also used calcium titanate and various titano-silicates, these being used when it is desired to introduce titanium into the weld metal. While **a number of** these conductive welding compositions **are more or less efficacious** in our process, **we prefer to use silicates of the alkaline earth metals,** such as calcium silicate, and we also prefer to add to these silicates **minor proportions of alumina** and of a substance adapted to lower the melting point, for example, a halide salt. (R. 956, Col. 1, ll. 62-75.)

More specifically, the welding composition preferably comprises, as its principal ingredients, silica (SiO_2), at least one basic constituent consisting of an alkaline earth such as lime (CaO) or magnesia (MgO) or a mixture thereof, and alumina (Al_2O_3). The silica and basic constituent are in approximately the proportions theoretically required to form metasilicates, although a substantial excess of silica is permissible and frequently advisable. (R. 956, Col. 2, ll. 1-10.)

The basic constituent preferably consists chiefly of lime and magnesia in approximately the proportions of three parts of CaO to one part of MgO, by weight; but other proportions are useful and within the invention. Basic materials other than lime or magnesia, for example oxides of **manganese,** titanium, or the alkali metals, and known fluxing agents such as borax or boric acid, **may be added in moderate amounts** without [illegible] the welding composition. (R. 956, Col. 2, ll. 25-35.)

It is possible, and may at times be desirable, to include in the welding composition materials which are transferred to the weld filler material during the welding operation and appear in and modify the properties of the completed weld, for example: ferromanganese, ferrosilicon, ferrochromium, calcium molybdate, carbon, or reducible chemical compounds thereof.

In a specific instance, we fused together 50 pounds of calcium carbonate, 9.4 pounds of magnesium oxide, and 40.5 pounds of silica until the reaction was complete. The materials used were of the purest quality used in the ceramic industries, but the fused product showed the presence, on analysis, of about 5% alumina. The fused material was cooled and granulated, and to each pound, one ounce of fluorspar was added. The material was then ready for use to form the conductive melt which is the principal feature of our process.

Welding compositions which have been used successfully and which serve as representative examples within the invention **have the following analyses,** by weight:

	I	II	III	IV
Percent CaO	29.5	31.24	29.18	40.12
Percent MgO	8.7	11.01	8.26	0.89
Percent SiO_2	56.4	52.40	57.48	52.94
Percent Al_2O_3	5.4	4.11	4.86	5.80
Percent Fe_2O_3	Low	0.13	0.24	0.23

(R. 956, Col. 2, ll. 43-75.)

CLAIMS REMAINING IN ISSUE ON QUESTION OF INFRINGEMENT.

(R. 960)

Claim 18.

18. A composition for electric welding containing **a major proportion of alkaline earth metal silicate,** and being substantially free from uncombined iron oxide and from substances capable of evolving gases under welding conditions.

Claim 20.

20. A composition for electric welding containing a fluoride and **a major proportion of alkaline earth metal silicate,** and being substantially free from uncombined iron oxide and from substances capable of evolving gases under welding conditions.

Claim 22.

22. A finely-divided unbonded fusible electric welding composition containing a fluoride and **a major proportion of an alkaline earth metal silicate.**

Claim 23.

23. A finely-divided unbonded fusible composition for use in electric welding employing a bare metal electrode as a source of weld metal, said composition being substantially free from substances capable of evolving a detrimental quantity of gas under welding conditions and containing calcium fluoride and **a major proportion of one or more alkaline earth metal silicates.**

CHART SHOWING EXPANSION OF PATENT BY READING SPECIFICATION INTO CLAIMS

METALLIC SILICATES

Claim 24, covering all metallic silicates, held invalid because "many metallic silicates are inoperative" (Op. R. 918, Finding 17, R. 925).

THE ALKALINE EARTH METAL SILICATES

Claims 18, 20, 22 and 23 limited to "a major proportion of Alkaline Earth Metal Silicates"

Calcium (Ca) — Claims 19, 21, 25, 28 and 29 limited to "a major proportion of calcium silicate" not designated as infringed.

Magnesium (Mg)

Strontium (Sr)

Barium (Ba)

Unionmelt 20, the basis of Respondents Commercial Success, consisting of Calcium and Magnesium Silicates, the former in dominant proportion. This is the patentees' discovery.

OTHER METALLIC SILICATES MENTIONED IN SPECIFICATION ONLY

Sodium (Na) — Inoperative (R. 653-4). Taught by Jones in moderate amounts only (R. 956)

Iron (Fe) — Inoperative (R. 652-3). Patent Office was told it was unsatisfactory (R. 1078)

Combination of these two silicates disclosed by Armstrong No. 1,241,899.

Aluminum (Al) — Used by Robinoff (clay flux) prior to Jones—operative when moisture eliminated (R. 1206-7); inoperative when not (R. 31, 879-81).

Taught by Jones in minor proportion only (R. 956)

Combination of these three silicates disclosed by Strohmenger No. 1,041,525

Manganese (Mn) — Operative. Taught by Jones in moderate amounts only (R. 956)

Disclosed by Miller No. 1,754,566.

Combination of these three silicates disclosed by Armor No. 1,467,825.

Cobalt (Co) Nickel (Ni) — Operability Unknown. Record silent as to use or operability. Further experiment required.

CLAIMS 18, 20, 22, 23 (IF EXPANDED BY RESORT TO SPECIFICATION) INCLUDE PRIOR ART, INOPERATIVE COMPOUNDS AND OTHERS OF UNKNOWN UTILITY.